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A

SYSTEM

OF

UNIVERSAL

SCIENCE.

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PHILADELPHIA:

PUBLISHED BY EDWARD EARLE, HARRISON HALL,
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1816.

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Charles J. Jackson, Jr.
Jan. 5, 1853.

District of Pennsylvania, to wit:

SEAL. BE IT REMEMBERED, That on the twentieth day of September, in the forty-first year of the Independence of the United States of America, A. D. 1816, William Fry, of the said district, hath deposited in this office, the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"A SYSTEM OF UNIVERSAL SCIENCE."

In conformity to the act of the Congress of the United States, intituled, "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned."—And also to the act, entitled, "An act supplementary to an act, entitled, "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned," and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

D. CALDWELL,
Clerk of the District of Pennsylvania.

INTRODUCTION.

This book purchased
at the Auction Sale of Pres Jefferson's
Library in Washington in the Spring of 1829
A. T. Jackson.

CONSIDERATIONS

ON THE

DIVISIONS

OF

HUMAN KNOWLEDGE;

AND ON

THE CLASSIFICATION,

AND

NOMENCLATURE,

OF

THE SCIENCES.

CONSIDERATIONS

ON THE

DIVISIONS

OF

HUMAN KNOWLEDGE;

AND ON THE

Classification and Nomenclature,

OF

THE SCIENCES.

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1. Extent and variety of human knowledge.

THE knowledge which the human race are capable of acquiring upon this earth appears, at the first view, too multifarious to be susceptible of arrangement.

On the primary approach to it, human knowledge resembles an immense structure; of which the magnitude oppresses, and the variety distracts, the mind.

Science is a magnificent temple, replenished with objects of wonder, utility, and beauty; and it

is not until after a long and familiar acquaintance with the edifice itself, its apartments and chambers; and even, if the comparison may be admitted, with its inhabitants and servitors, its priests and its ministers; that we are enabled, at length, to perceive the regularity of its construction, and the accommodation of all its sumptuous furniture, and uses of all its splendid apparatus.

Acquired in laborious and painful detail, the discoveries of an individual transcended by a train of successors, the advances of this generation surpassed by those of subsequent, the language and the science of one nation engrafted upon those of others, the vast and variegated attainments of modern times accumulated upon those of ancient ages; to us, of this age, and of this country, knowledge is presented in rich and copious stores, abundant in materials, defective, principally, in arrangement.

The power of intellect appears inadequate to grasp the mighty mass; and a correct and satisfactory division of the knowledge at present in the possession of the human race, or an elegant and appropriate classification, and nomenclature, of the sciences, have not yet been effected.

2. Objects of the present enterprize.

To ascertain, upon correct principles, the general departments, or provinces, to which all human knowledge ought to be assigned; to divide those respective general departments, or provinces, into their appropriate classes; to subdivide the several classes into distinct orders; to dilate every

order into specific and individual sciences; and to apply to the whole a definite, and a classical, nomenclature;—these are the objects of the present enterprize.

Aware of its importance, and of its difficulty, I am humiliated, in the contemplation of it, by the comparative feebleness of my powers. 3. Difficulty of execution.

On the affection of a country, destined to attain no inconsiderable distinction in the great career of human exertion, I rely, to pardon so humble an attempt in the service of her science; and on the liberality of an enlightened age to impart to the system here devised, if, in any degree, worthy of consideration, those essential improvements, and those solid perfections, which, however necessary and indispensable, my utmost assiduity has been incompetent to supply.

Satisfied that my exertions cannot injure science, I relinquish the hope, alike vain and unseasonable, that they can either materially extend its dominion, or rapidly accelerate its progress.

A severe principle of duty commands the execution of the present task; and beyond a simple obedience to that duty I dare not look.

In order to carry this difficult and delicate enterprize into successful execution, and to fulfil the task with precision and certainty, it will be proper, previously to the exhibition of the system, which it is the object of the ensuing discussion to 4. The ichnography.

develope, to pass through two preliminary investigations, in themselves, neither uninteresting, nor unentertaining.

5. The first part.

The first of these will consist in tracing, with a rapid step, the progress and advancement of the human mind, in the various countries of the world; and in the different æras of history.

With a clear and comprehensive view of the origin and progressive accumulation of our knowledge, we shall not only be better prepared for the distribution and management of our present resources; but may, perhaps, attain a more distinct and definite perception of their future and ultimate extent.

The people of the United States of America can thus, and thus only, be enabled to perceive their exact place, and standing, and relation, as a nation upon the earth; receiving from other nations, with modesty and gratitude, the treasures of knowledge, where other nations are competent to impart them; not presuming to impart science to other nations, until the science which other nations have obtained has been perfectly acquired; and maintaining, with intrepid firmness and independence, the ground they shall afterwards assume, when they know, and feel, themselves to be correct.

6. The second part.

It will, in the next instance, be necessary to collect with an industrious, a careful, and even a minute attention, and to exhibit, at the same time,

with the utmost candor and fairness, all the divisions and systems of knowledge, and every classification of the sciences, which have ever been formed, attempted, or suggested; and those whether of ancient times, or of modern days; so far as an acquaintance with them may, at this period, and in this country, be conveniently attainable.

I press not forward to claim a place among the great men of whom I shall here have occasion to speak. Much less may I presume to constitute myself their critic and judge. In such a circle of glory, my only safety will be in humility; and my only merit the consciousness of inferiority.

A fair exposition, however, of their several systems, with the respective advantages and disadvantages of each, the scientific mind is entitled to require; and such, though both delicate and laborious, it will become, in the execution of the investigation which I have undertaken, my humble duty, with proper deference and respect, to present.

Thus, and thus only, shall we be enabled to derive a reasonable assurance that what is now proposed to be done may not have been already executed; and in a better manner than that in which it may be now contemplated to perform the task. Thus shall we perceive, with greater clearness, the defects which at present exist in the arrangement and classification of science; and, perhaps, the causes of those defects. Thus, per-

haps, shall we become able, eventually, to apply the proper remedies and remove the obstacles; to surmount every difficulty and obviate every embarrassment; to supply what is deficient, and to exscind what is excrescent; of that which has been lost to restore what is possible, and of that which is still to be found to accelerate the discovery.

7. The third part.

The developement and explanation of the system which has been here devised will next occupy attention.

The most important part will consist in the evolution and establishment of the proper divisions; but the application of a nomenclature will remain, a task of perhaps still greater difficulty and delicacy in the execution.

In traversing these regions I shall have much to ask from the patience and indulgence, of my fellow-travellers. No small portion of them is a dreary and a thorny wilderness, where the most ardent curiosity must cool, and the firmest nerve must tire. Frequently, I shall have to lead those who will venture with me into arduous and devious tracks, where, before us, many have been already bewildered; where I have often been myself bewildered; and where, still, I shall not be held excusable if I have the infelicity of leaving them in the same situation. Happy will it be, if with the aid which they may administer, we may be extricated from the difficulties, without discredit or disadvantage.

8. The difficulties of nomenclature.

In nothing are there more tastes to gratify, more diversities of opinion to reconcile, more hostilities to avert, and more antipathies to conciliate, than in nomenclature. To one, that will be pedantry, which, to another, is substantial learning. Gravity must preside in one department; while, from another, fancy must not be absent. One taste will relish that which displeases another; and, sometimes, that will be deemed superfluous and over nice, which, to a palate more fastidious, will not appear nice and refined enough. This wants polish, and that possesses an excessive brilliancy. Elevation is the fault of one side, of the other depression. One ear recognizes softness and melody, where another acknowledges only harshness and dissonance. Here utility is sacrificed to beauty; and there a mere coarse and homely utility preferred to ease, and grace, and elegance.

A good, and more particularly an euphonic nomenclature, is an achievement at once of the highest difficulty, and of the utmost importance. A good nomenclature may sometimes help a bad system; but even a good system can never aid a bad nomenclature.

Nor can I flatter myself with the futile and unreasonable expectation of being able to give satisfaction to others, where I have been utterly unable to satisfy myself. An incompatibility of character seems requisite, and the antiquary and the statist must be combined; bringing to the subject an acquaintance with the whole world that is past, as well as with the whole world that

is present. Scarcely any thing less than the complete possession of science, in its ancient, and in its modern state, could impart a character of demonstration to a reorganization of it; and of such a range of science who shall pretend to the possession? Far from having any claims to it, I shall often be led astray by my ignorance, and still more often betrayed by a false knowledge; in some instances, impeded by the absence of that which I have forgotten, and still more inextricably embarrassed, in others, by the want of that which I never knew. The liability to error is certain, and obvious, and great. Where there is an absolute necessity to judge, many materials from which to form the judgment, a limited time within which the determination is to be made, and a contracted sphere for consultation and advice; not to be aware of, and to acknowledge, an exposure to the commission of multiplied errors, would be, presumptuously, to claim an exemption from the necessary imperfections of human nature.

9. Encouragements to perseverance.

Yet my fellow-traveller will be surprised, as I have been myself astonished, at how much it is possible for perseverance to overcome; how happily a difficulty will be sometimes obviated, by a fortunate and unexpected contingency, at the very period when it was expected to prove most formidable; how prompt and strong, investigation and decision, may, by discipline and habit, be rendered; and how much kindness and encouragement console and support, in his undertakings, the ever desponding and irresolute mind of man.

I hope to determine some positions, on the chart of knowledge, in a manner so rigorous, as not to admit, hereafter, of any departure from them. If I succeed in ascertaining only one of this character, my labour will not have been in vain, and my ambition will be fully gratified.

No doubt can attend the utility of the enterprize. The subject is the finest which ever engaged the attention of the human mind, and will conceal intellectual poverty in its copiousness and dignity.

Time and repeated exertion will effect that of which indolence would have despaired; and though it is very possible that in the present undertaking I may totally fail, the prevalence of a proper spirit in my fellow-citizens may yet secure the honour of a correct and satisfactory classification of science to the United States of America.

10. The fourth part.

After having ascertained the great departments, to which all human knowledge must be referred, divided the great departments into appropriate classes, distributed the classes into their several orders, dilated the different orders into specific and individual sciences, and applied to the whole a definite and a classical nomenclature; in short, after having propounded to the scientific world in general, and to that portion of it comprehended within the Columbian Republic particularly, the system of classification and nomenclature which it is the object of the present

discussion to develope; it will be desirable, if opportunity should yet remain, to take a view of the advantages with which such a system may be attended; to display its relations to an intelligent and enquiring people, with respect to the diffusion of knowledge, the future advancement of science, and the improvement of the arts; to explain its application to education, and to national and state institutions for the propagation of literature, to encyclopædias and scientific periodical publications, to the establishment and arrangement of libraries, the collection and republication of the classics, and even to the manner of writing, and the form and size of books; and, lastly, to investigate the principles on which a great national institution, ought to be constructed, embodying in one concurrent channel all the learning and talents, all the erudition and genius, in the United States of America, for the honour of our particular nation, and for the general benefit of the human race.

11. Preliminary views.

The first object is the historic progress of science.

Ere, however, we enter this amphitheatre of nations, and are allured by the fine scenery which it every where presents; ere we cultivate an acquaintance with the various people to whom we are indebted for our existing civilization and learning; let us, for a few moments, arrest our impatience and curiosity, and take a view of the ulterior limitations and boundaries of our knowledge; discover the comparative recency of its

origin; and even establish a scientific æra, by a reference to which its retrospective, and its prospective, progress may be measured.

12. The limitations of human knowledge.

To prevent the mind of man, in its first approximations to knowledge, from being elated and carried away with the idea of its being at present unlimited; and to preclude the supposition of the probability, or possibility, of its ever becoming so; it is entirely proper for him to take a survey of the limitations which God and nature have assigned to the progress of his knowledge, to humble himself at the portals of the temple, to bow his head on the lowest step of the lofty altar.

13. The spiritual world.

In the first place, the whole spiritual world, in relation to human means of investigation, is shut up to him; and is hermetically sealed. Whatever may be the duration of the human race upon this earth, it is not probable that man, in his present form of existence, will ever, by any means merely human, come to know any thing more of the spiritual world than he already knows.

14. The visible universe.

The material universe is then alone left. Of this we can never know the existence of more than those objects which our visual organs, with their artificial aids, are competent to reach; and this may be a portion infinitely small in its ratio to the whole.

15. Our own so-

Among the multiplied solar systems which the stars within the reach of our visual organs, and

lar system.

telescopic instruments, may present, it is not probable that we shall ever be able to perceive the existence of any of their planetary bodies. In this respect we seem to be, absolutely, restricted to our own solar system.

16. Our own planet.

Nor is it at all within the verge of probability that we shall ever be able to visit any of the other planets of our own solar system, and impart to their inhabitants our wondrous acquisitions in science; or that, on our part, we shall ever receive any visits from their inhabitants, and obtain from them a communication of their precious attainments.

Even the satellite of our vicinity will remain in this seclusion from us.

If so slight a change as the difference of our position, in relation to the sun, at the torrid or frigid zone; or in summer and winter; or in our aerostatic excursions; or in the valley and on the mountain; shall so much shake and try our feeble constitutions, there is no possibility that we could sustain those changes, which a more extensive range, within our own solar system, would require.

Between the inhabitants of our earth, therefore, and those of every other planetary body, in the whole universe, an impassable gulf is fixed.

17. Exiguity of the earth.

And how small is our earth when compared with some of the other planetary bodies of the same solar system to which it appertains! It is but

one twelve hundredth part of the size of the planet Jupiter.

18. The habitable part.

Of our own earth the surface only is the residence of animation, and of that surface more than one half is water. The northern temperate zone, for a long time, exclusively presented the seats of civilization; and of that zone two-fifths only are land. Of the portion of terrestrial surface which is solid, part only is the seat of civilization and learning; nor do we know how many ages must elapse before the whole shall become so.

19. The imbecility of science.

And, in the most civilized, and most learned, states of our society, what is it that we know? Can we understand the most obvious and simple plant or animal? Or shall we ever understand the most obvious and simple animal, or plant? Never! The worm shall ever be the foil of our science, and the blade of grass a mystery!

How little then, and how minute, how comparatively insignificant and abortive, is not only all that we do know; but all that, by any possibility, we can ever come to know!

How futile then, and how frivolous, and even how impious, and how profane, are the suggestions of some modern philosophers of France, and even of England; the Condorcets and the Turgots, the Godwins and the Darwins of the age; *that our race is infinitely perfectible; that our knowledge will disdain all limitation; that our minds may become omni-*

potent over matter; that our bodies may triumph over disease, and even over death!

There are then, certainly, limits which the God of nature has fixed to the knowledge of man; and though, as learning may increase, there may be a constant approximation to those boundaries, they are still boundaries which, in our present form of existence, and by means merely human, we shall never be permitted to pass.

20. The cultivation of it still a duty.

Nor ought we, on the other hand, to be too much mortified, humiliated, or discouraged, by a sense of the contracted span and limit of our knowledge. It is our duty to improve the intellect which our Maker has given us; and there is not less philosophy than piety in the obedience of the Christian precept, "*add virtue to faith, and knowledge to virtue.*" Our knowledge, however small the mass of it, and however contracted its limits; however lost our world in the great construction of the universe, and however minute and entomological our race may appear in the eyes of superior beings; is yet all-important to us. It is our peculium in the universe of which we are a part. It is our little all.

It will be interesting, therefore, to turn the view to the origin of our present knowledge; and to trace the path by which we have been led to the existing civilization and learning upon this globe.

21. The compa-

In proportion as we extend our investigations into the learning of our race, and examine it as we

find it mingled with the traditions, the mythologies, the religions, and the histories of nations; or even as laid open to us on the great page of nature, and in the geology of our planet itself; we become, gradually, more and more satisfied, and at length certainly convinced, of the comparative recency of its origin. rative recency of its origin.

This great truth did not escape the observation of the ancients. In that part of this discussion where the science of the Romans will pass under review, it is proposed to exhibit a quotation from one of their finest poets, unfolding and illustrating this idea; if, on arriving at that period, it can readily be adverted to. In like manner, in exhibiting the science of Arabia, a passage, from the most ancient and the most elegant production of the human intellect which is in the possession of the scientific world, will be introduced; forcibly urging the same consideration. 22. Observed by the ancients.

It ought to be recollected that this consideration, though evident to the good sense and discernment of the ancients, was, in their time, urged under every disadvantage. The science of each nation was, at their day, peculiar to itself; and the whole mass could not be brought together, and compared. Each nation was preposterously desirous of concealing its own science, and entertained an unreasonable contempt for the science of other nations. The whole globe was not then known, nor could any nation be perfectly satisfied that the world might not contain some other nation, with even the existence of which it was not yet acquainted;

and whose attainments might throw into distant shade the proudest acquisitions of the human mind in their own. Some remote region might enclose an isolated people; whose records, and authentic history, might travel infinitely back, casting a gleam of light over the gloom and obscurity of early time. Some yet untraversed ocean might be passed; disclosing new worlds, and new nations, to the view. Even after the whole surface should become known, some inhumated memorials of past times may be found, some archæological records may be dug up, and some Sepharvaim may disgorge its long buried encyclopædia.

23. Confirmed by the moderns.

It is but recently that what was only conjecture, and reasonable surmise, for them, has been reduced to certainty, for us.

Now, all countries have been visited by the persevering toil of the traveller, and the hardy adventurousness of the merchant; and the princely liberality of British enterprize has displayed the hydrography of the globe. No ocean, no continent, no island, of any size, remains unexplored.

The records of the two nations, whose claims to an extravagant antiquity were still outstanding and unsettled; confounding the scientific mind, and assailing the authenticity of the relations contained in the sacred writings of the Jews; have, at length, been fairly tested; and their unfounded pretensions reduced to their true rank of mere mythology, and gross fable.

The globe itself has been interrogated; and geögnostic science corroborates the response of all solid learning, of all authentic history, of the genuine civil and religious documents of every people. Divergent rays of information, concentrated from every quarter, demonstratively confirm the miraculous veracity of the Hebrew records; and the consequent, comparative, recency of our existing civilization and learning.

24. A scientific æra established,

It will be proper, then, to select some æra, some chronological point, at which investigation may commence, and from which it may flow, in continual progression, both subsequent and anterior; an æra which men, forgetting the distinctions produced by the diversities of religious belief, may agree in using, wherever true science may be cultivated.

It is the property of science to delight in certainty; and the kind of certainty which it seeks is human and reasonable certainty. What is mere conjecture, and every thing of which the authenticity is questionable, it rejects. It submits with reluctance to the dictates of mythology; and can it, with strict truth, be said that it has never been stubborn before the awful authority of religion? Principles, pregnant with an immense train of consequences, it is, and ever ought to be, slow to assume. Free therefore from every mythology, and even from every religion; entirely unconnected with every dogma, and with every assumption; let some event, in relation to our race, be seized, in the current of time, marked with rea-

sonable certitude, and calculated to come into no particular collision with the sentiments of men of the utmost diversity of religious belief; from which a continued chain of civilization and learning may be deduced, down to the present time; and from which it may be possible to retrogress, when necessary, into periods of higher antiquity.

25. founded on the earliest astronomical observations;

It is known to us, by authentic history, that in the year three hundred and thirty-one, anterior to the Christian æra, the science and power of Greece pervaded the dominions of the ancient Persian and Assyrian monarchs, in consequence of a train of military operations, among the most splendid and brilliant, if not actually the most splendid and brilliant, which decorate the annals and exploits of our race; and we are credibly informed, and have no reason to question the truth, the sincerity, or the precision of the information, that in the metropolis of the Chaldaic empire was found a series of astronomical observations reascending one thousand nine hundred and three years anterior to that period.

Let us take these facts as we possess them, and an æra may be established in science, from which its subsequent progress may be continuously deduced, down to our own times; and with which also all anterior information, both authentic and inauthentic, will be susceptible of comparison.

26. and deductions

From these facts some deductions may be made, of importance.

First. They amount to a proof, characterized by reasonable certainty, and founded entirely in human authority, that our race has continued uninterruptedly upon the earth from that period to the present. made from it.

Secondly. We are thus made certain that not only the social state, but even the political state, was then actually raised; and has ever since, under various modifications, been maintained, down to our own times.

Thirdly. We have thus evidence that some mode of communication by characters, the instrument and handmaid of all other science, was then in the actual possession of our race; since a record of a fact was made, and handed down.

Fourthly. We have proof that some science existed, since a particular science, that of astronomy, was attended to, and cultivated; and those which are ancillary to it, language and mathematics, could not have been entirely neglected.

Fifthly. On a comparison of this æra with the authentic civil and religious histories of the most ancient literary nations; the Chinese, the Hindoos, and the Jews; we find no room for any material collision; since an adequate period, according to the course of ordinary fact and observation at the present day, had elapsed from the epoch of a deluge, in which all their histories concur, and that according to the shortest chronology, to admit of the rise of a political puissance, and its

natural and necessary companions, literature and science. Our own nation was planted in the year 1608, and was first felt as a political power in the year 1756. From a century, then, to a century and a half, is a period within which a population, from its primary elements, may acquire consistency and strength. The very shortest chronology, that of the Hebrew records; and the shortest chronology of the Jewish, the Samaritan, and the septuagint, copies and version, of those records; would allow one hundred and fourteen years from the deluge to the origin of political society.

At the present time, therefore; the year one thousand eight hundred and sixteen of the Christian æra; we have exactly four thousand and fifty years, or forty centuries and a half, for the progress of civilization and learning, from the earliest times of which it is at present possible for our race to obtain satisfactory human information, up to their present expanded and expanding state.

From a beginning, thus marked with certitude, we shall be enabled to trace the progress of science among nations; to perceive their past, their present, and perhaps, their prospective, scientific relations; and to view the scientific relation of our own nation to the other nations of the earth.

27. Extreme

Still, ere we enter into this scenery, let us once more restrain the impatient step, to consi-

der, if but for another moment, the extreme brevity of this period. brevity of the scientific period.

We have instances of men now living on the earth whose age exceeds a hundred years.

A succession of forty such men would carry us through the period.

Eighteen more would take us to the æra of the creation, according to the Hebraic chronology.

Taking, however, the ordinary standard of human life, seventy years; and allowing the rising generation to exceed the age of twenty years, before they might be presumed to be competent recipients of the knowledge of their progenitors; it would only require a succession of eighty generations of mankind to transmit all the accumulations of science, from their earliest commencement, down to those now living in the world.

This period cannot be regarded as any other than one of extreme brevity; and if man has no reason to indulge pride when he takes a rational view of the utmost possible extent of his science, he has still less, with which to flatter his vanity, from its antiquity.

28. A review of antediluvian science.

The earliest epoch from which it is possible to institute a comparison of the attainments of the human mind, connected with the æra which has been assigned, is as regards the anterior, and even the antediluvian, inhabitants of the world.

Of the fact of a deluge the traditions, the religions, and the histories of nations, and even nature herself, bear evidence. Of the precise date of the event there may be room for doubt; but of the general fact itself, the testimony is ample, and ought to be satisfactory to the most circumspect and sceptical mind.

The early history of every ancient nation concurs in representing the existence of an antecedent race of human beings upon this earth, a calamitous destruction of them, and a subsequent renewal and reorganization of human society. All their histories correspond in the great outlines; and, when the facts are separated from the superstition and mythology with which they have been mingled, the evidence is not only distinct, but conclusive.

29. Chinese testimonies of the deluge.

That history of their country, which the Chinese themselves regard as the most authentic, commences the narrative with a deluge. It represents it *as bathing the feet of the highest mountains, as entirely covering the less elevated hills, and as rendering all the plains entirely impassable, and desolate.* Of the state of society, anterior to the calamity, no farther accounts appear to be given, than that, as a prime minister is soon afterwards introduced, reestablishing the course of rivers, constructing dykes and canals, and regulating taxes, it must be of course presumed that a state of high civilization had existed previously to the catastrophe; and that those who survived it, derived some benefit from the attainments of their predecessors.

They represent the first man as having had no father; and introduce a mythological circumstance, concerning his mother, relative to a rain-bow, which would indicate a disfiguration of the scripture history. They locate the appearance of the primitive men in the vicinity of the region where they must have first dwelt according to the scripture history, on their disembarcation from the ark. They assign the date of the event, at a medium, within two centuries and a half of the point assumed for a scientific æra; some bringing it a century lower, and others carrying it four centuries higher. At the same period they introduce the science of astronomy as commencing.

30. Hindoo testimonies.

The Hindoos consider the earth as having undergone certain successive destructions, and as destined to experience a succession of others. The last which it has suffered, and which they regard as the third, of four, that it is destined to experience by water, they not only date at the same time with that recorded in the scripture history, but correspond, with exactitude, in some important particulars. They state the number of persons who survived that calamity to have been *eight*. They represent all the existing race of mankind to be the descendants of *three* persons. They date their first human sovereigns a little before the commencement of the scientific period which has been deduced.

31. Persian testimonies.

Of the mythology, the history, and the philosophy, of the ancient Persians, the Guébres, or Parsis, are the sole modern depositaries. They speak

of *a universal deluge as having happened before the reign of their first king.*

32. Chaldæan testimonies.

The Chaldæans not only represent a deluge as having occurred, but enter into a long train of antediluvian history. According to them the human race were first taught the arts and sciences by an irrational animal, who came out of the sea, participating of the nature of man, and of a fish, and dwelling with the former during the day, and with the latter during the night. He not only instructed men in letters, in geönetry, and in religion; but taught them government, legislation, and the advantages of civilization. Nor were his doctrines merely orally delivered; but he left to mankind works on the origin of the world, and on the principles of political economy; and was succeeded by a number of other animals, of the same description, who more particularly explained what the original one had summarily and concisely delivered.

33. Antediluvian Encyclopædia.

Respecting a deluge the Chaldæans represent, that a divine being informed the tenth and last of their antediluvian monarchs that such an event was about to take place; and commanded him to reduce to writing, for the benefit of a postdiluvian race, the knowledge, the sciences, and the history, of mankind, from the origin of the world down to that period of time. This record of all antediluvian science, well secured by water-proof envelopements, he instructed him to bury in the city of Sepharvaim, until the deluge should be past; and directed that the survivors should then repair

to the place and regain it. The name of this city signifies, *the city of the sciences*, *the town of books*, *the place of a collection of books;* and is derived from a Chaldaic and Hebrew word signifying *a book*. It is also called Sippara, and Sipphara; and was translated by the Greek name, Pantibibla, having the same import. It is mentioned in the scriptures; and, in the septuagint translation of them, is called Seppharvaim. It is exhibited, in the elegant American maps of Mayo, on the left bank of the Euphrates; about three hundred miles north-west from Babylon.

34. Construction of a floating asylum.

After the execution of this philanthropic injunction, the favored monarch was instructed to build a ship, to store it with provisions, to enter into it with his friends and relations, and to take with him birds and quadrupeds. On a compliance with this direction the inundation took place, which he and his friends alone survived. He ascertained the cessation of it by sending out birds, which were compelled to return for want of a resting place, but the second time returned with mud adhering to their feet, and on the third experiment entirely disappeared. After having worshipped the gods, the survivors repaired to Sepharvaim, and dug up the inhumated records.

35. Syrian and Phœnician testimonies.

In Syria a tradition of a deluge existed; and though in what remains to us of the Phœnician history no mention is made of such an event, there are evident fragments of primitive and antediluvian narratives, corresponding in the outline with the Jewish accounts.

36. Egyptian testimonies.

The Egyptian mythology alludes to the event of a deluge; and the learned men of that nation had preserved some very exact traditions respecting so great a revolution, though, like those of some other countries, they had used strenuous and unjustifiable exertions to antedate the epoch of it.

37. Grecian and Druidic testimonies.

The Grecian writings amply confirm the fact, but are still more lost in the chronology; and as the learning of the Greeks, and that of all people since them, has been derivative, it will be superfluous to pursue the investigation farther; noticing only that the ancient Druids had a similar tradition.

38. The scripture testimony.

These recognitions of gentile testimonies of a deluge, and of the period of its occurrence, prepare the mind for the clear, distinct, and authoritative, account of that event given in the scriptures. Nothing can be more exact; and nothing at the same time, more awful and impressive, than the description which they exhibit.

39. The construction of the ark.

A vessel was constructed of cypress, five hundred and forty-seven feet in length, ninety-one feet in breadth, and fifty-four feet in height; with three stories of apartments; and covered with pitch, both on the external part, and throughout its whole interior. In this the most ample supply of provisions, stores, and provender, for the use of men and animals, was accumulated; and in this vessel did the human beings, and the animals which survived the deluge, take refuge, and live during the period of one whole year; effecting

their escape from the wide-spread desolation and destruction every where around them.

40. Duration and effects of the flood.

And then the sources of the ocean were broken up, and the flood-gates of the sky were opened, and an incessant torrent of rain, of nine hundred and sixty hours in duration, gradually submerged the whole habitable earth, covering the summits of the highest mountains, to the depth of twenty-seven feet; and sustaining, on the mighty tide, in security and safety, the precious remnant of animated nature. All other terrestrial animals; bird, quadruped, reptile, man; every thing which had respiration, utterly perished.

41. Geological testimonies.

The present globe bears the impression of this grand and terrible event; and renders no unequivocal response to the candid enquirer into its archæology.

However agreeable and beautiful the picture which the surface of the earth presents; diversified with land and water, mountain and dale; decorated with a luxuriant vegetation; the finest variety of animals every where disporting; and man, its monarch, embellishing it with cultivated fields, and thronged cities, and all the elegant monuments of his taste, and of his industry; yet, a very succinct investigation acquaints him that it has not been always so, that this order and this tranquillity have not always reigned, and that the earth itself, as well as those which inhabit and enjoy it, have been the victims of revolutions.

42. From the remains of antediluvian marine productions.

In both hemispheres, in every continent, in every island, the earth, when penetrated, exhibits undeniable evidences, by the remains of marine productions which it offers, of having been, formerly, submerged by the ocean. These exuviæ are found at elevations greatly above the level of the present ocean. Even the granite summits of the most elevated mountains satisfactorily attest that the substance of which they are composed has once existed in a fluid form.

43. From the remains of antediluvian mammiferous quadrupeds.

The accuracy and the intrepidity of modern science have, however, at length, with respect to this subject, closed the door of any farther dubiety. Results have been obtained, by restricting the investigation to quadrupeds; the remains of which have been dug up out of the earth, from extraordinary depths; as precise as they are wonderful. For these elucidations the scientific world are indebted to the investigations of Mr. Cuvier of Paris, who has prosecuted the intricate and difficult subject, alike, with genius, and with industry; and who is still living, the cultivator and the ornament of science.

From the labours of Mr. Cuvier have been ascertained and classified seventy-eight different antediluvian quadrupeds, of which the remains have been obtained. Of these seventy-eight animals, twelve are ascertained to belong to species now living on the earth; seventeen more have considerable resemblance, but the identity is doubtful; and forty-nine are distinct species, not now living on the earth, and hitherto entirely unknown

to naturalists. Fifteen are oviparous and sixty-three viviparous, sixty-one are terrestrial mammiferous animals, forty-four are herbivorous and hoofed animals, and eight are carnivorous and clawed animals. Of these the United States of America afford the remains of two, of the most enormous magnitude; one, the mammoth, a phytivorous and hoofed animal, greatly superior to the largest quadruped of that description now existing on the earth; and the other the megalonyx, a carnivorous and clawed animal, possessing a still greater superiority to the lion than, in relation to the elephant, is manifested by the mammoth.

44. Astronomical testimonies.

Nor does astronomical science withhold her important testimony.

45. The deluge occasioned by a comet;

Sir Isaac Newton has ascertained that the trajective path of the comet, which appeared last in the year 1680, approximates to within three hundred and eighty thousand miles of the orbit of the earth. Of the physical consequences which would result from the earth being in that part of its orbit, at the time of its passage, though we can have no adequate idea, we have still reason enough to entertain an awful terror. The period of this comet appears to be nearly five hundred and seventy-five years. Accordingly, at that interval from the year 1680 history records its arrival; and, in like manner, in a retrogressive progress, at the same interval of time, a previous appearance of it is recorded; and, in order to reduce within still narrower limits the range of hesitation and uncertainty, at the same interval

of time, the Roman history presents ample and satisfactory evidence of yet one earlier appearance. This is the only well ascertained one anterior to the Christian æra; though Mr. Gibbon traces it still farther back, and Homer appears to allude to it, in the seventy-fifth line of the fourth book of the Iliad. It is very remarkable that four retrogressive applications of the same interval will bring out, within a few months, the exact period assigned for the occurrence of the deluge by the Hebraic chronology. That a tradition existed of the appearance of a comet, at the æra of the deluge, is attested by several authors; and, among others, by Pliny. Of the admission of physical causes for the production of the event the nine hundred and sixty hours rain is sufficient authority.

46. which is again to appear.

This comet will again appear in the year 2255; and, ere that period, though rapidly approaching, it is probable that the United States of America will contain, for application to that, or to any other physical phænomenon, as much scientific acquirement as any other country in the world. Observation will of course be directed, with greater intensity, to this interesting subject. Two remarks may, in the mean while, be recollected. The first is, that comets are, in general, less observable in their approximation to the sun, than in their recession. The second, that comets may generally be expected earlier than the periods of their return would indicate. These, further, lead to a third and important consideration. Sir Isaac Newton ascertained that the comet of 1680 approached within one hundred and twenty-six thousand miles

of the body of the sun; and very rationally conjectured that, by experiencing successive retardations, it would eventually enter into the solar mass. It may therefore come to pass that if that *ecpyrosis*, or general conflagration of the earth, and purification of it by fire, of which there are prophecies, should be its early destiny, the same instrument may be the means of effecting it; and, if not, this dangerous visiter may be absorbed into the body of the sun, appearing as a spot on its surface, and the earth thus be delivered from the most formidable astronomical enemy which threatens to derange the existing order and constitution of things.

Thus, if man has no reason to be elated with the extent of his knowledge, at its extreme possible limit; but, on the contrary, the greatest cause to be humbled, both by its contracted boundaries, and by the recency of its origin; he must be still more humiliated on considering the precariousness of the tenure on which the whole of it is held.

47. Antediluvian science.

Through that cloud of obscurity which hangs over the early times of the world, it is not to be expected that, at this day, we should be capable of penetrating. Ages have passed away, without any records of them; the story of subsequent years has been left to depend only on tradition; and both tradition and history have, generally, become blended with fiction. It is only, incidentally, that a ray of light breaks into the darkness; and it is, especially, but from mutilated fragments, that a mere glimpse of antediluvian science can be obtained. Great events may have occurred, and ex-

ploits achieved attended with celebrity at the period of their transaction; but both the actors and the witnesses have passed away, and the memory of them all has perished for ever.

48. On the scripture accounts.

The first ten chapters of the book of Genesis afford the only authentic, though concise, memorial of antediluvian history, and of the affairs of mankind down to the rise of a political power on the earth, from which science and civilization may be regularly deduced.

From these it appears that a system of religion was erected; and that sacrifices to the Deity, both of the fruits of the earth, and of animals, constituted a part of its rites. The knowledge of a God is, therefore, coexistent with the human race.

The computation of time by years, months, and weeks, had been introduced; and indicates, of course, no inconsiderable progress in astronomy. Horticulture and agriculture, which are in some measure dependent on it, engaged attention; nor is it possible that the ancillary sciences of arithmetic and geömetry could have been entirely unknown. There is reason to believe that the cultivation of the grape, and the manufacture of its juice, had been attained. Certain it is, that the domitation of animals had been effected; that the delightful occupations of the shepherd, and of the herdsman, prevailed; and that the use of metals, and more particularly, of iron, of brass, and of gold, had been acquired. Even the precious gems had obtained their value; and the correspondent

science of the lapidary been introduced. Nor was the gratification of taste pretermitted. The art of music had been invented; and was attended with the fabrication of instruments of no ordinary compass and power. Nay cities, the ornament and the pride of human society, had been built; and what a mass of knowledge, what a train of arts, were indispensably necessary for their construction and their maintenance!

49. On collateral authorities.

Other authorities afford a few equivocal illustrations of antediluvian science.

Philo multiplies the number of cities; and Josephus introduces the military art, and fortification. The latter attributes to Adam the prediction of a destruction of the world by water and by fire; and to the children of Seth the invention of the zodiac, and of written language. The rabbinical writings; by which is understood the Hebrew books which have not been admitted into the canon; ascribe great science to Enoch, and more particularly mathematical learning. The invention of the zodiac, and of written language, they attribute to him specifically. The Arabian authors pretend that Enoch received, immediately from the Deity, thirty books, explaining the most occult sciences. They represent him to have written a work, in explanation of science, which was deposited in a chest, and buried in the earth, before the deluge; and which was afterwards discovered and opened by the patriarch Abraham. The Arabians preserve traditions that the Egyptian pyramids are

of antediluvian construction; and that all the sciences are inscribed within them, in hieroglyphics. The ancient hieroglyphics cut on the granite columns of Egypt, and the characters engraved on the written mountains of Arabia, are imagined, by modern writers, to be monuments, actually remaining, of antediluvian operations. Such also have been supposed the hieroglyphics referred to in the third chapter of the book of Judges. The Greek Christians ascribe to Enoch the prediction of a deluge; and high attainments in science. They state him to have been the Thoth, or Hermes, of the Egyptians; to have built the pyramids; and to have engraved on them the elements of the sciences, lest the memory of them should perish in the deluge. Origen, an early Christian father, mentions both the prophetic and scientific productions of Enoch; and the book of Jude, in the New Testament, exhibits an actual quotation from the former. Eusebius, another early Christian father and bishop, about a century later, mentions an ancient Jewish writer, under the name of Eupolemus, who was living when the septuagint translation of the canonical Hebrew books was made, and who alludes to the books of Enoch, and ascribes to him the scientific knowledge which then existed; and the productions of Enoch are also cited by Alexander Polyhistor, who lived about a century before the Christian æra. Nay these very productions are said to be still extant in Abyssinia; and Mr. Bruce is represented to have succeeded in that interesting enterprize in which Mr. Du Peiresc failed, the obtention of copies of them.

50. Accounts confirmed by modern American facts.

It has been very rationally contended, by many celebrated and judicious writers, that the first postdiluvian inhabitants of the world derived very immediate and important benefits from the attainments of their predecessors. The rapid advances of mankind, in civilization and science, after the deluge, cannot otherwise be accounted for. The facts, connected with the history of the United States of America, in this, as in another important instance, reduce to certainty, what was before only reasonable conjecture. We have savage man actually before us, and we know him well. He possesses a natural intellect more vigorous and energetic, in relation to the objects on which it is exercised, than is possessed even by the man of civilized society. For centuries, civilization, with all its benefits, and all its charms, has been presented to his eye; and it offers no attractions. The philanthropy of successive civilized governments; the French, the English, the American; has been extended to him, without any effect. The benevolence of various religious sects; the jesuits, the friends, the baptists, the methodists, the moravians; has been interposed in vain. A savage he is, and a savage he will remain. He cannot even be brought up so high as to the pastoral state. With the exception, to which the exertions of Colonel Hawkins have given rise, in Georgia, this fact is universal on the northern continent. If then any accounts of the early postdiluvian state of mankind are credited, this modern fact, under our immediate observation, conclusively demonstrates that their knowledge was not the result of the natural progress of society. Dykes, canals, taxes; the

domitation of animals, agriculture, the manufacture of wine; the construction of towers, written language; are not the attainments of man, emerging, by natural gradations, from the state purely savage.

51. The importance to science of the fact of a general deluge.

It is important to science, as well as to religion, that a correct view should be taken of the facts connected with the deluge. The curiosity of man, and particularly when stimulated by partial information, naturally induces him to ascend to the highest attainable antiquity. At the point where authentic documents fail him he perceives a chasm, which his imagination supplies with fiction. Too proud to acknowledge ignorance, his whole force is idly expended on a barren desert. He selects for his habitation an ether-built and extra-mundane tenement. Human realities and human evidences are too contemptible for him. He moves in an entirely visionary sphere of his own creation. On no other principle can the extravagant, and perfectly ridiculous, mythologies of India, of Egypt, and of Greece, be accounted for. Impudent and unjustifiable fictions are imposed as truths; and the human intellect, at once, so pure, and so powerful, in itself, is subjected to interminable slavery, and doomed to permanent imbecility.

Science is also exposed to injuries from its own professors. Inflamed with an hostility to the Hebraic records; even regarded, in scientific matters, as merely human authorities; some philosophers, and particularly of France, have indulged

themselves in attempts as wild as they are unjustifiable. A very recent one derives Christianity *from the constellations of the zodiac.* Because astronomy requires attentive and protracted observations, Mr. Bailly, in a learned, and perfectly ingenious dissertation, asserts the existence, long before the chronology of the most ancient people known to us, *of an antecedent and primitive Scythian race.* Mr. Dupuis is most romantically convinced that the signs of the zodiac have an antiquity of *sixteen thousand years.* A still more recent writer pretends, from the excavations in the mines of the island of Elba, *that forty thousand years have elapsed since they were first explored.* Authentic human evidence ought to be received from every quarter, and to meet with a candid examination. A philosophical reverie, however, is entitled to, at any rate, as little attention as a fiction of mythology.

A solid foundation for real piety, or for real science, can never be laid, so long as the mind remains attached to these imaginations.

The people of the United States of America may, therefore, it is believed, repose, with reasonable certainty, on the following principle; *that in relation to them, civilization and science cannot be traced back, on authentic human evidences, farther than forty centuries and a half.*

52. A review of

In taking a review of the progress of science, subsequent to the deluge, our attention must ne-

the science of China.

cessarily be attracted to the eastern hemisphere; and, in the first instance, to the Asiatic nations.

53. The antiquity of China.

There are two Asiatic nations of which the history is marked with a very singular feature. They stand in the double relation of ancients and of moderns. Before the Grecian or the Roman glory rose, China and India were populous and civilized countries. The Grecian and the Roman glory have long passed away, and China and India still remain populous and civilized countries. The same sun, which gives us light this day, gave light to them before it shone upon a Greek or Roman eye; and the same sun, which shines for us this day, has this day shone upon the same nations. Like the water-spout uniting the boundless ocean to the boundless atmosphere, the history of China, particularly, is likely to present an isthmus, connecting the two infinitudes of time.

54. Its extended geögraphy.

The extended geögraphy of China renders it interesting, as well as its antiquity. Stretching over nearly seventy degrees of longitude, from the barbarous nations which bound it on the west, in the interior of Asia, into the Pacific ocean; comprehending some of the islands of the latter; and having its whole literature common to all the dominions of the Japanese empire, and to some other surrounding states; the science and the learning of China may be said to cover half the breadth of the eastern hemisphere. Occupying nearly forty-five degrees of latitude, and extending from Cochin China to Kamtschatka; it possesses one of the finest, as well as largest, portions of the tem-

perate zone. In so fine a country, during so long a time the seat of civilization, and blessed with such, comparatively, uninterrupted tranquillity; it would be contrary to the principles and constitution of the human mind that great intellectual progress should not be made.

55. First settlement.

The first settlements of China appear, from its own history, to have been made in the north-west, on the head waters of the Yellow River; and within no long period from the dispersion of mankind from the plains of Shinar. Its early annals are filled with the difficulties which the human race had to encounter from the abundance of the waters; and some centuries were necessary to impart to the empire consistency and strength.

56. Religion.

Instructed in the existence and attributes of a Supreme Being, the sovereign of the universe, by a tradition not far removed from its source, their religion, entirely uncorrupted by any idolatry, was stamped with a patriarchal purity. Sacrificial rites; which, though marked, indeed, for a necessary reason, with blood, were otherwise characterized by the utmost simplicity; constituted all its ceremonies.

57. The hieroglyphic language.

The peculiarities of the language present a subject of curious and interesting investigation. All the languages of mankind may be referred to two great classes, the hieroglyphical, and the alphabetic; the one, exhibiting to the eye, the symbols of ideas, and the other, the symbols of sounds. It might be a question, difficult to be determined

by anterior considerations, which of these is best calculated to form a powerful and commodious instrument of human communication and investigation; at once adapted for the convenience of business, and for the service of science. In a theoretic view, it would appear that a character, capable of expressing human *thought*, to the eye, with readiness and precision, would be, intrinsically, superior to one which could only effect the same purpose, by the cumbrous intervention of *words*. In those instances where we actually make use of a hieroglyphic language, we accordingly find that it is decidedly marked with that superiority. Our arithmetical figures, and our algebraic signs, are the principal instances in which we at present use a hieroglyphic language; and we soon become aware of the greatness of the effect. Notwithstanding the diversity of the spoken languages, the arithmetical characters are attended with no possible ambiguity, and are universally received through the civilized and scientific world; with the exception only of the Chinese themselves, and those nations with whom their literature obtains. The quality which marks our numerical cyphers, that of universal intelligibility, notwithstanding the diversity of oral language, pervades the whole written language of China. The inhabitants of Japan, of Tonquin, of Cochin-China, and of some other countries, though using different spoken languages, use the same written language; and have their books in common. Some unsuccessful attempts have been made in Europe to invent a philosophical and universal language, expressing thoughts, and not words. In two instances, however, which

are somewhat of this nature, complete success and great utility have attended the exertion. The language of music, though conversant entirely of sounds, is, strictly speaking, a hieroglyphical language. The language of the deaf and dumb, which has recently been brought to such perfection, and which excludes entirely even the idea of sound, is an extraordinary hieroglyphic speech; and which is remarked, like other hieroglyphical languages, to possess an uncommon energy of intellectual expression. On referring therefore the question to experience, as far as experience has yet gone, the decision might appear equally uncertain. There is, however, one argument, which, if the subject is, in no respect, incorrectly appreciated, ought to be conclusive. Where a whole language is hieroglyphic, so much time must be expended in the mere acquisition of language, that little is left for the attainment of any other science.

58. The oral language.

The spoken language of China affords as singular and wonderful a literary phænomenon as the language of books. The whole language consists of only three hundred and thirty words, every one of which is monosyllabic; and of which every one terminates either in a vowel, or, with slight exceptions, in the same unvarying consonant.

59. Astronomy.

Like all the other nations of antiquity the Chinese had early commenced their attention to astronomy; and, like them also, their acquisitions were prompt and rapid. They ascertained the length of the year, and the revolutions of the moon; distinguished the ecliptic from the celes-

tial equator; discovered the five planets, known to western astronomy by the names of Mercury, Venus, Mars, Jupiter, and Saturn, and the periods of their respective revolutions; and invented a zodiac consisting of twenty-eight signs, and divided the heavens into constellations. They even attained some of the proudest and more recent acquirements of our modern astronomy. The right ascension of the fixed stars was ascertained, and the times of their passing the meridian; telescopic stars were discovered; the precession of the equinoxes was known; and eclipses were predicted, and exactly calculated. Almost all the apparatus of astronomy was possessed; spheres, quadrants, gnomons, astrolabes. Magnificent observatories, worthy of a learned and polished people, were constructed; and a succession of attentive observations made, ascending into a high antiquity. The appearance of comets, and of new stars, has attracted more attention than among other nations. Their history is regulated by a sexagenary cycle; and an annual ephemeris brings down astronomical science to popular use.

60. Mathematics.

All these are sufficient guarantees of their attainments in mathematical science. The ratio of the square erected on the base of a right-angled triangle to those on its sides; which was an original discovery in Greece, made by Pythagoras, and considered of so much consequence as to be worthy of a hecatomb; would appear, by the Chinese annals, to have been known to the prime minister who acted as regent during the minority of the second emperor of the third dynasty. The

same annals relate, that when the ambassadors from Cochin China, after visiting the Chinese court with presents, had their audience of leave, and were on their return home, they were complimented, by that minister, with an instrument which always indicated the south, for their better accommodation on the journey. As that great minister, who was so much admired for his learning and talents, died in the thirty-third year of the twenty-first cycle, these events are thus ascertained to have been anterior eleven hundred and four years to the Christian æra.

61. Agriculture.

Agriculture is carried to the highest possible degree of perfection. In this they excel the English; who are the greatest scientific agriculturists among the western nations. Every useful, and every rare, production of the vegetable kingdom is in their possession.

62. The arts.

It is in the arts that their superiority is the most decided. The manufacture of wool, of cotton, of silk, and of flax, had with them an early origin; and have attained great perfection. Silk is, perhaps, a discovery peculiar to themselves. Porcelain; paper, printing, ephemerides, books, gazettes, encyclopædias; gunpowder, the magnet; were in their hands before the inhabitants of Europe became familiar with them. Their canals are the wonder of mankind.

63. Seclusion of China,

Many nations have cherished the policy of extreme reserve and jealousy with respect to strangers, and none more than the Chinese. In order

to judge of the beneficial results of this policy, it is only necessary to compare their singular history with that of any other people. China presents a moral phænomenon. Of other monarchies the thrones are crumbled, and the dynasties forgotten. China stands alone, a pyramid in the solitude of time, rearing its head amidst the ruins of kings, and the dissolutions of nations.

64. precludes the reciprocation of science.

While this peculiarity has almost locked up, on the one hand, the science which she possesses, it has, on the other, equally precluded the science possessed by other nations from being communicated to her. Her knowledge of geögraphy is extremely deficient. The modern acquisitions in astronomy are not known to her. She has little medical science, little natural philosophy; no chemistry, no electricity. Her pride is in government, morals, politeness, public economy, and national education. When it is considered that all her acquisitions are entirely original, and that of the extensive mass of knowledge of which she is possessed, little, if any, is derivative; she cannot cease to be regarded as the wonder of the human intellect.

65. Prospect of more immediate reciprocation.

In taking a prospective view of the scientific relations of mankind, one of the most interesting considerations which are presented is, the hope of a general reciprocation of science. It may, perhaps, be intended, in the dispensations of Providence, that, anterior to that happy state of the human race, when there shall be but "*one faith*," and "*one love*," there should be but *one science*.

Notwithstanding the long seclusion of the oriental from the western nations, there is, at present, from the combined operation of various causes, an immediate prospect of a more intimate communication. I have just been in possession of a translation into the Chinese language of all the books of the New Testament. It was printed at Serampore, in India, in consequence of the persevering and spirited exertion of the modern Missionary and Bible Societies. The execution of this enterprize gave rise to an unexpected improvement in the art of printing, as relates to that language. Moveable metal types have been introduced, by the European missionaries, in the place of the Chinese wooden blocks. These enable the impression to be made with greater expedition, and with greater correctness; and reduce two thirds of the expense. The printing has a beauty exceeding any thing seen in China itself. The peculiarities of the language render successive editions practicable, with a cheapness and speed not attainable in any other language; a Chinese type not being a letter, but a noun, or a verb, and, in certain cases, a phrase, or a short sentence. With cheapness and beauty, this improvement unites that great desideratum in printing, the facility of correcting the typography to any extent; and even with greater ease than in the Roman character. Before the translation is finally printed, it undergoes nine or ten revisions; and though the competency of the translators might be questioned abroad, such suggestions have proceeded neither from learned natives, nor from Europeans who understand the language into which the translation is made.

Though the wise foresight of the Chinese cabinet suppressed the influence of the society of the Jesuits, during the last century, yet a recent edict of the reigning emperor has permitted the free propagation of the Christian religion, throughout his dominions; accompanied with the expression of a sentiment, as correct and sublime, as it is personally honourable to himself.

66. Importance of certain recent facts.

The importance of these recent facts, relative to the Chinese language, cannot but be duly appreciated. The principles of pure religion may not only be displayed where idolatry might prevail; but if the contents of one book can be fairly exhibited to the mind, a communication of the contents of every other book will be equally practicable. Thus the whole science of one nation may be transfused into another. The capacity to receive will be accompanied with an equal capacity to give; and whatever is valuable of oriental literature or science, which is not at present possessed, may be acquired. If an hieroglyphical language possesses any essential advantages, the necessity of inventing one is entirely superseded; as one already exists carried, probably, to higher perfection than any new one could readily be, and in actual use among millions of mankind. It is to the invaluable labours of the reverend Dr. Carey, and the reverend Mr. Morrison, that these results, so operative on the future moral destinies of the human race, are to be principally attributed. So much unexpected good has already flowed from the small association which was formed at Kettering,

in England, on the second day of October 1792, for the propagation of the gospel among the heathen.

67. European intercourse with China.

The Romans were not acquainted with China. They knew that there was a civilized people beyond India, and assigned them a name. Silk was also a commodity known to them, but was so high as to command its weight in gold. The first intelligence of the existence of this people was brought to modern Europe by Marco Polo; a Venetian, who penetrated into it by land, in the thirteenth century. Europe was then so barbarous that his account was entirely disbelieved; and his relation was absurdly regarded as mere romance. The existence of an ancient and learned people on the globe, who had remained unknown to the Greeks and Romans, was indeed not readily to be admitted possible, according to the state of knowledge, at that æra. The sagacious mind of Columbus, however, treasured the important fact; *that so much longitude was added to the extreme point of ancient navigation.* Impressed with a clear conviction of the sphericity of the earth, the important mistake, committed by the ancients, in their designation of longitude, induced him to believe, on principles very scientific, if the observations had been accurate, that the oriental parts of the world were nearer, in a western direction, than they actually were. This led to the discovery of the western hemisphere; and that to a more successful exertion in the eastern direction, by the circumnavigation of Africa. When Albuquerque first met the Chinese navigators, he was astonished to find a greater refinement of manners

than was, at that time, known to the nobility and kings of Europe. After the discovery of America, and the circumnavigation of Africa, the European literary mind was disposed to atone for its original illiberality, and to admit the possibility of the existence of other ancient and learned people, who might not have been known to the two ancient civilized nations of Europe. The progress of science has, however, since ascertained that there are none of this description, excepting those of China, and India. The hardy audacity of British enterprize has subverted the power of the latter; but it is to be hoped that the former will retain her freedom and felicity.

68. American intercourse with China.

The United States of America maintain a constant friendly intercourse with China; and our commercial citizens, after long experience, add their tribute to the intelligence and virtues of her inhabitants. The mild but intrepid character of the American people has made its impression on this distant nation; and the period is just approaching when a commercial intercourse will be sought, along the higher latitudes of the Pacific, from the northwestern regions of the one country to the northeastern of the other. The settlements of the Spanish, the Portuguese, the French, the Dutch, scattered along the insular positions around her; the power of Great Britain approaching her on the south-west; the naval arm of the Columbian Republic about to be extended to her on the north-east; perhaps no great lapse of time may obtain whatever of science may yet be occluded in the

capacious and venerable bosom of the Chinese empire.

69. Philanthropy of China.

It is not ferocity or misanthropy which occasions the reserve of the Chinese government to strangers. Its policy pacific and just; and charged with the happiness of an innumerable population; it has, hitherto, properly, avoided the collision of fierce and barbarous nations. The state of the world is, however, obviously changing; and its policy may recognize the change. That the principles of its administration, in relation to foreign nations, are piously humane and philanthropic, the following fact satisfactorily evinces. On the twenty-second day of June, in the year 1731, advice was received, at London, that the Prince George, an English ship, had been wrecked upon the coast of China; and that the administration of the neighbouring province appropriated and paid upwards of six hundred and sixty pounds, sterling, for the relief of the unfortunate sufferers; which was distributed among the officers and sailors who were saved. Here is an instance of *national* benevolence, which had no parallel in the annals of any Christian country, at that time. The contrast between their conduct, and that of the English themselves, on similar occasions, meets the intrepid animadversion of a celebrated English nautical poet.

70. The Chinese Encyclopædia.

In that part of this discussion in which the divisions which have been made of human knowledge are enumerated, the Chinese Encyclopædia, and the principles of its construction, will meet investigation. The advancement of this eastern

nation, in this important particular, will be compared with that of the occidental nations. It constitutes a work in fifty-two volumes, which has never been translated, but of which the arrangement has been obtained; and if the testimony of Mr. J. P. Abel-Rémusat, of Paris, may be deemed adequate, on a question of Chinese literature, it is a production, with respect to the intrinsic discussions, of no inferior merit.

71. A review of the science of India.

The second Asiatic nation, which is marked with that extremely interesting feature of being both a modern and an ancient people, though not equally extensive in domain with the empire of China, presents, notwithstanding, a very magnificent geögraphy.

72. Extensive geögraphy of India.

From the great range of the Caucasian mountains on the north, to the island of Ceylon on the south, and stretching from the confines of Persia on the west, to the Chinese territories on the east; India embraces thirty degrees of latitude, by as many of longitude, and possesses nearly an equal portion of two zones.

As the extensive region on its east is pervaded by the written language, and by the literature of China; so the whole expanded territory, from the latter to Persia, seems to be covered by the language, and by the literature, of India.

73. Its antiquity.

India is, unquestionably, one of the earliest quarters of the world in which the sciences, which dignify the human understanding, and the arts,

which minister to the comforts of human society, have been cultivated.

74. Destitute of history;

Unfortunately, India has no history. A few ancient and obscure poems compose its belles lettres. An extravagant and ridiculous mythology has reduced to comparative imbecility, at once the intellectual, and the corporeal energies, of many millions of the human race.

75. and of uniform government.

It is another misfortune which has attended the fate of India, that though possessed of those two essential bands of human union, identity of language, and congruity of religious sentiment, the powers of political combination have never been adequate to the establishment of one extended and puissant empire, through that vast domain.

76. The prey of invaders.

From the earliest æra, to the present, India has been the victim of every invader. Great Britain is the last, and will probably secure her dominion. No Asiatic power has the ambition, and no European the competency, to disturb her rule. The period must necessarily be regarded as extremely remote when the intrinsic energy of the human character shall impart to history another lesson, that, of islands, great continents are not the natural appendages; and when a less unsatisfactory response may be admissible to the philanthropic interrogation of the spirited English poet;

> "Is India free? and does she wear her plum'd
> "And jewell'd turban with a smile of peace,
> "Or do we grind her still?"

77. Consequences to America of British power in India.

The establishment of the Britannic power in India is attended, in one respect, with consequences of peculiar interest to the people of the United States of America. Whatever attainments in science may be the destiny of the latter, the identity of the modern language renders them common to the scientific portion of this interesting department of Asia.

78. The Sanscrit language.

An ancient language has existed in India, which, though not, at the present day, the colloquial medium of any particular part, is understood, universally, by the learned. It has been designated by a variety of names, among those who are conversant with the learning of Hindostan; and, though not the most correct, yet, for reasons which this opportunity will not be used to explain, it will be recognized, in this discussion, only under the appellation of Sanscrit. Sir William Jones; a name which, throughout the world, commands instantaneous respect; considers it as more perfect, more copious, and more refined, than either the Latin or the Greek. Some have gone so far; but, probably, on grounds by no means correct; as to consider it the great and common parent of all the alphabetic languages. The Sanscrit alphabet is composed of fifty letters; and the reverse of the Arabic, and of the Hebrew, the language is written from left to right. A complete grammar of this language is possessed; composed by the reverend Dr. Carey, printed at Serampore, in India; and transmitted to the American Philosophical Society in Philadelphia, through the medium of the late President of the United States of Ame-

rica. All the canonical Hebrew books, and all the books of the New Testament, have been translated into, and printed in, this language; diffusing those sacred volumes from Amboyna to Sirdhana, a distance of fully four thousand miles.

79. The astronomy of India.

The progress of the scientific mind in India, in astronomy, has been a source of the utmost astonishment. Not only would the precession of the equinoxes appear to have been immemorially known, but a curious mythological chronology was constructed upon it; confounding, at first, in no small degree, the investigations of the candid enquirer into science. Rational and sound philosophers have at length developed all the mystery; and bold fictions, ascending beyond the deluge, and beyond the creation, and that for millions of years, have been reduced to the standard of reason, and of truth. It is humbly hoped that, in the early part of this discussion, the general fact of a universal deluge, the æra of its occurrence, a subsequent renewal and reorganization of human society, and a deduction of uninterrupted civilization and learning, from its first authentic commencement, have been established, and that entirely on human authorities, in such a manner as to admit of no departure from them; defining, with precision, the region of dubiety, from the region of certainty.

It is unquestionable, however, from genuine and unadulterated facts, that the astronomical observations in India were, not only very ancient, but very exact. It is not to be accounted for, on

any ordinary principles, that a people, once possessed of real science, unless disturbed by exterior ferocity and barbarity, should suffer themselves to lose the principles on which the structure was built; and to retain only the mechanical operation. Such, however, is the real truth with respect to India. The men of science of that country can calculate an eclipse; but do not understand the principles on which the calculation is founded.

80. Mathematical science.

The real mathematical science of China is concealed by a cloud; but that of India is in part fairly subjected to examination. In India there is a real arithmetic, a real geömetry, and what is equivalent to an algebra. The people of India have the true title, and an honourable one it is, to the invention of the arithmetical characters. They were first adopted, from them, by the Arabians; and thus imparted to modern Europe. Obstinate prejudice opposed the innovation; contending that they might be useful in science, but that they were injurious in business. The modern man of business has, however, on this, as on other laudable occasions, yielded to the authority of science; and could, no where, be persuaded to resume the ancient computation. It is not comprehensible how correct mathematical and astronomical science can obtain among the Chinese, without equivalent symbols; and yet their arithmetic has never been satisfactorily explained. In every other respect, there can be no doubt that the arithmetical characters will become universal, and be coexistent with science.

In agriculture, and in the arts, the inhabitants of India exhibit, also, the characteristics of an intelligent, and of an ingenious people. Their productions, and their manufactures, have been in request from the earliest times to the present. 81. Agriculture and manufactures.

It is alone their superstition, for it would be profane to give it the name of a religion, which degrades them. It is a superstition, at the same time, frivolous and sanguinary; and, on the one hand, their triviality, and, on the other, their obscenity, forbid an explanation of its rites. To die with the tail of a cow in the hands is the summit of earthly bliss, and the passport to etherial felicity. Human immolations, and those of what is most innocent, and what is most dear, constitute a part of its exactions. While in China there is no hereditary nobility, and the imperial diadem itself is not hereditary, in the European sense of the term, in India the whole population is distributed into hereditary casts; unjustly sacrificing the privileges and happiness of individuals, and impiously violating the divine ordinance of the equality of mankind. If a being, of a certain superior cast, be approached by one of their most degraded, he may, with impunity, inflict upon the latter, the punishment of death. Food and drink are defiled even by the shadow of a person of such description passing over them; and both water and milk, thus rendered corrupt, must be subjected to a sanctifying purification, before they can be used. A more cruel, a more silly, a more obscene and infamous superstition, has never deformed the history of the human race, than is 82. India degraded by her superstition.

exhibited by the inhabitants of India; and it ought to be a subject of gratification, to those who cherish a sympathetic regard for the temporal, or for the eternal felicity of men, that both mercantile cupidity, and military haughtiness, have, at length, assented to the propagation of Christianity in Hindostan.

83. Scientific view of Persia.

With respect to antiquity the claims of Persia are not inferior to those of India, while the advantages of climate are superior. The first military operations, of which history affords any account, relate to this country. Its monarch; already master of the regions watered by the Euphrates, and at the head of the kings of that vicinity, as his tributaries; is represented, in the book of Genesis, as extending his conquests to the Mediterranean. In the time of Cyrus the limits of this monarchy extended from the mouth of the Indus, to the Ægean sea. Cambyses added to it Egypt; and the book of Esther describes Persia, in his reign, as reaching from India to Æthiopia, and comprehending one hundred and twenty-seven provinces. This powerful monarchy undertook the subjugation of the Grecian republics, and was signally defeated. An awful retaliation subverted the Persian throne, and annihilated it on the record of succeeding history.

84. The Persian magi.

What the Greeks termed a *philosopher*, the Persians denominated a *magus;* deriving the word from an Hebraic radix, which signifies to *meditate.* Of men of this description their most famous was Zoroaster; and his division of human knowledge will be given in the second part of this discussion.

Of the language of Persia, modern science is in full possession; but can claim no ancient books.

85. Voluptuousness of the Persian court.

The Hebrew book of Esther, in connection with that part of it which exists only in the Grecian translation, is a precious remnant; displaying the interior of the ancient Persian court. It exhibits a voluptuousness entirely unknown to modern manners. A scandalous and unpardonable levity prevailed, with respect to the lives of mankind; and laws, proudly claiming the attribute of immutability, fluctuated with the diurnal caprices of the tyrant.

86. The Persian religion.

The ancient religion of Persia is considered as remarkable, on account of its freedom from idolatry. Its professors ascribe to it a patriarchal origin; and it is considered doubtful, by modern literati, whether there are not still preserved, in the hands of the present followers of that religion, some genuine ancient books. No persons could exhibit a character more amiable, worthy, and inoffensive, than has, at all times, marked the professors of the ancient Persian religion.

87. Precludes them from being a maritime people.

To Persia, perhaps, belongs the popular division of the elements; but the superfluous attention to the preservation of the purity of the earth, the water, the air, and the fire, and the train of human observances, to which it gave rise, are peculiar. It absolutely precluded the possibility of their becoming a maritime people. The mouths of navigable rivers were even, at a great expense, artificially obstructed by the Persian rulers, in order

to prevent their subjects from any access to the ocean.

88. Labours of modern missionaries.

The religion of Persia is singular in containing a prophecy of its own destruction, by another religion which should come from the west; and a number of other circumstances have concurred to prepare the way for the reception of Christianity. The scriptures have recently been translated into, and printed in, the Persian language; and wherever Christianity is propagated the sciences of the Christian portion of mankind, unquestionably distinguished by an intrinsic superiority, may be expected soon to succeed.

89. Scientific view of Chaldæa.

The region intervening the five great seas; the Caspian, the Euxine, the Mediterranean, the Arabian gulf, and the Persian gulf; is the most central, and probably the most elevated part of the oriental hemisphere, and was, unquestionably, the cradle of mankind. The fictions of mythology, and the dreams of philosophers, are alike dissipated by the beam of truth. On a comparison of all authentic testimonies, and even regarding the whole as merely human authority, this is the original seat of the present postdiluvian race of mankind; and here is the commencement of the civilization, and of the science, now in the possession of the human race.

90. Primitive position of mankind.

The physical varieties, which have distinguished the species in their migration, from this primitive position, through the different countries of the earth, have been discussed and accounted for by a

cisatlantic writer; the reverend Dr. Samuel Stanhope Smith, of the State of New-Jersey; in a production, which not only reflects honour on American talents, but is one of the finest monuments which have been erected to science, in any country.

91. The first monarchy.

It is in this region, also, that is presented the interesting moral phænomenon of the transition from the patriarchal form of government to monarchy. Reason, and correct theory, would have taught that this transition was natural, and, perhaps, necessary, in the progress of human society; but here is exhibited the actual fact. When the victory was obtained, of man over the animals, which contested with him the sovereignty of the globe; when the multiplication of its members, and their remoteness, prevented human society from being considered any longer as a single family; civil government must necessarily have been instituted.

92. Monarchical government contrasted with the patriarchal form.

Forty centuries have elapsed from the establishment of monarchy to the rise of pure representative government; and, without any comparison of it with the latter, it would be improper to leave the patriarchal form without a recognition of its distinctive features.

93. Features of patriarchal government.

The patriarchal form of government was founded in love. As none could be more capable of promoting the interests of a family than he who possessed the qualifications of age, and of experience; so none could be presumed actuated with a more sincere, and a more pure desire of advancing its

welfare, than he who was allied to every member of it by the affinities of nature. The picture of innocence, affection, and primæval virtue, exhibited in the patriarchal history, combines the most engaging and delightful traits of human society.

94. Little resembled in the monarchical.

Monarchy could only render itself amiable in proportion as it approached to patriarchy; and was impressed with features of resemblance. Such, however, is the infirmity, and so strong are the vices of man, that the approximation has been small, and the resemblance almost evanescent. If the Chinese government be excepted, the patriarch and the monarch have ever been widely apart; and, from its first institution, down to the very times that we touch, monarchy has offered, on its wide-spread canvass, almost one unvaried scenery of violence, and pride, and lust, and sensuality.

95. Primitive written language.

The invention of alphabetic language, if not regarded as of antediluvian origin, ought, undoubtedly, to be attributed to Chaldæa. All the written languages of mankind, except that of China, can be traced to a primitive alphabet. As Abraham is claimed by the Jews, by the Arabians, and by the Persians, as the common father of their science; as he was the first person who is known to have been called a Hebrew; as he came from the frontier of Chaldæa; as the languages are the same, and differ only in dialect from the Phœnician, the Samaritan, and the Syriac; and as the most ancient writings, of which the scientific world is in the actual possession, are in that lan-

guage; the evidence is conclusive, with respect to every language but the Sanscrit. Of that language the testimonies are satisfactory that it is of philosophical construction; and therefore posterior in date. The possession of the first alphabetic character is no inconsiderable title to veneration in the competition for scientific glory.

96. Astronomical science.

This, however, is not the only distinction which appertains to the ancient Babylonia. The science of astronomy had here its origin; and it need not be repeated what extensive departments of collateral knowledge that single science involves. The progress of the various arts, which at once define and advance civilization, was no less conspicuous.

97. Corrupted by superstition.

Science among the Assyrians received also its first misapplication and abuse. Astronomy soon ceased to be science. The noblest acquisition of the human mind was corrupted for the basest purposes. A superstitious mythology connected all the affairs of this earth with celestial motions and influences. The planets were erected into goddesses, and gods; and an idolatrous worship instituted, characterized by the most sanguinary and obscene rites. From this scene of delusion and impiety the favoured father of the ante-idolatrous religions received a divine vocation; but to this idolatry successively bowed some of the finest nations of the historic volume, Syria, Phœnicia, Egypt, Greece, Rome.

98. Science of

The Arabians claim, on a title better founded than that of the Persians, and equally solid with

ancient Arabia.

that of the Jews, a descent from the patriarch Abraham.

99. The book of Job;

It is from this country that we, unquestionably, derive the oldest written production of the human mind, in the present possession of the scientific world.

It has been formerly doubted, by those who have cultivated biblical criticism, whether the book of Job was a production of the Jewish legislator himself, or received by him from another source. In either case it is equally admitted that it was written in Arabia.

100. the oldest book in the world.

The work contains also intrinsic evidence of at least this degree of antiquity. In the most direct attempts to display the power, and the providence, of the Deity, no other historical event is alluded to than that of the deluge. The exodus from Egypt, or any of the events of anterior or subsequent date, connecting Jewish transactions with that country, are never noticed. The Jews, so careful of their sacred books as even to count and register the number of letters, in order to prevent them from adulteration, do not record the introduction of this book into their learning at a later period than that of Genesis. A gentile production they would not have accepted from any other hand than that of Moses. It was, therefore, either written by him, or is of higher antiquity. That it was not written by Moses the Hebraic critic infers from the extreme difference of the stile, and of the language, in that work, and in

the pentateuch. Origen, a primitive Christian bishop, says that it was translated by Moses from the Syriac. An American divine, of distinguished erudition, has, however, thrown more light upon this subject than all his predecessors. The reverend Dr. James P. Wilson, pastor of the first presbyterian church in the city of Philadelphia, in his explanation of the original of the first sixteen chapters of that book, has almost conclusively proved who was the author of it; and the subject of greatest admiration, which remains, is that so finished a composition should be the production of so young a man. A descendant of the brother of Abraham, neither his language nor the purity of the theology, remain any longer a mystery; and it may be regarded as a most valuable relic of the ancient gentile religion, uncorrupted by idolatry.

101. Moral of the poem.

The moral of the poem consists in the inculcation of a truth, dark to the gentile mind, but clear to that of the Christian; that *innocence and piety are not an exemption from the afflictions of this world.* To illustrate this position, the heroic sufferer is triumphantly carried through a scene of tribulation, depicted with every pathetic trait which can interest sensibility; and with every beauty of the poetic pencil.

102. Sublimity of the poetry.

After a dialogue of the highest animation, but of which some of the beauties are lost in the antiquity, and in the obscurity, of the language, the poem concludes with an address from the Deity, delivered from a whirlwind; and which has ever been considered as the sublimest production of

the human mind, in any age, or in any country. It embraces fine descriptions of the cosmogony; of the cataclysm; of atmospheric phenomena; and of various objects of natural history, the lion, the raven, the wild-goat, the zebra, the rhinoceros, the ostrich, the hawk, and the eagle. The delineation of the military horse is inimitable. To present the climax of both ornament and energy in description, those of the hippopotamos, and of the whale, are reserved for the last.

103. A passage from this book introduced.

It was from this work that it was contemplated, in the early part of this discussion, to introduce an original passage, which, taken in connection with another, from the Roman poet Lucretius, may satisfactorily show the impression made on the human mind, from the very earliest times, that the civilization, the learning, and even the existence, on the earth, of the present race of mankind, are but of recent derivation.

The following is the original passage:

שאל נא לדור רישון וכונן לחקר אבותם: כי תמול
אנחנו ולא נדע כי צל ימינו עלי ארץ:

The following may be presented as a translation; not essentially varying from the Grecian, the Roman, or the Britannic translations.

"Inquire of the preceding generation, and be "prepared for the minute investigation of *their* "progenitors; and we are but of yesterday, and "know nothing, for a shadow are our days upon "the earth."

The same appeal to antiquity is made in another Hebrew poem; that composed by Moses himself, on receiving the solemn warning, "*behold thy days approach that thou must die.*" The appeal is attended with a result precisely similar. The highest research terminates in a period comparatively recent.

104. Confirmed by another passage in Deuteronomy.

This production not only itself exhibits the belles lettres in a state of the highest improvement and refinement; but affords, also, evidences of the great advances made in astronomy. The art of navigation appears, too, to have attained considerable perfection.

A strange peculiarity marked the science of antiquity, that of inviolable secrecy; and among no people did it prevail more than with the Jews. The language, the history, the arts, and the sciences, of foreign nations were, by the Jews, regarded with horror and contempt. Their own books were sacred; and were religiously concealed from an enquiring world. When Ptolemy Philadelphus, actuated by an ardent love of learning, and the purest philanthropy, procured a translation of the Hebrew books to be made; the Jews instituted fasts to commemorate the calamity, and to atone for the imputed humiliation. It was an unpardonable offence, in a Jew, to pronounce even the name of a foreign god; and a scrupulous reverence prevented him from uttering the most sacred appellation of his own. An impassable barrier was erected between the Jews and every other people of the world by whom science was cultivated.

105. The science of Judæa.

106. Importance of its language, history, and theology.

Yet of the exquisite energy of their language we have familiar evidences, perfectly convincing; even under every disadvantage of translation. In their strict attention to genealogy they exactly resembled the Arabians; and were more attentive to their national history. Where authentic facts are preserved they serve as land-marks to future times; and, in supplying the resources of legitimate narrative, diminish the temptations to extravagant fiction. But for the historic volumes of the Jews the knowledge of early times would have been utterly lost to the people of the United States of America; and modern narrative must have commenced with Herodotus, or a less rigorous imagination indulged in the theophanies of Homer.

From this interesting people we derive our pure theology, and the sublime ethics of our religion.

107. Singular destiny of the Jews.

Their knowledge of astronomy, and of many of the arts, though derivative, was respectable; but the exiguity of their country, their interior dissention, a succession of national calamities, and, above all, a peculiar destiny, have left them the wonder of the world; no longer an ancient, and yet not a modern, people; a people that are gone, and are yet still here; a nation, diffused into others, without a sceptre, and without a country.

108. Science of Phœnicia.

Of the height to which a spirit of enterprize is capable of raising a people, Phœnicia presents the most remarkable example.

109. The navigation and commerce of the Phœnicians.

Confined to a slip of territory, at the extremity of the Mediterranean, the Phœnicians extended their colonies and their commerce over the world. They discovered Great Britain; and penetrated near to, if not within, the arctic circle. They crossed the equator; circumnavigating Africa, from the Arabian gulf, to the straits of Gibraltar. The very circumstance which Herodotus adduces, as the ground of his incredulity, is, in modern days, an argument, in itself convincing, that this enterprize was really executed. We now know that sailing west, along the southern coast of Africa, the navigators must have the sun on the right.

The metropolis of Phœnicia, and the activity of its commerce, are described in the Hebrew book of Ezekiel, with a liveliness and accuracy which render the composition superior to the finest parallel passages in the Greek or Roman poets. The description of the ships in the second book of the Iliad, or of the warriors in the seventh book of the Æneid, will not bear a comparison, either in geögraphical, or in poetical beauty, with the picture of the extensive navigation, and variegated population, of Tyre.

110. Their manufactures.

The exquisite skill of the Phœnicians in manufactures was universally celebrated. Their knowledge in metals, in timber, and in stone; their solidity of structure, and sublimity of taste, in architecture; were conspicuously displayed, in the erection, and decoration, of the temple of Jerusalem. The discovery of glass is due to this inge-

nious people; and, by them, was delivered the alphabet, to Greece.

111. The scientific character of the Egyptians.

The Egyptians however, contest, with all nations, antiquity, letters, and science.

112. Their antiquity.

The first sovereigns of Egypt, according to its own historians, were gods, and demigods; and, like the literati of India, it is not, until after many thousands of years, that the Egyptian mythologists condescend to enumerate beings, merely human, as their rulers.

There is a good sense in the American character, which abbreviates discussion, in every case of this description, and leads to the adoption of one principle, as a maxim; that whenever a nation ascends into the skies, for administrators of its ordinary concerns, it is a certain proof that it is possessed of no authentic history.

The Egyptian history begins to be authentic about nineteen centuries anterior to the Christian æra; and this, at once, places that people among the most ancient nations.

113. Their languages.

The Egyptians had two written languages, at the same time; one hieroglyphical, and the other alphabetic. The former was sacred; and was used for their theology, and for their science. The characters of the latter have been discovered, in modern times, by the investigations and penetration of the late Abbe Barthelemi; and there remains, now, no doubt of the identity, in essential particu-

lars, of that alphabet, with the Phœnician, and with the Hebrew.

114. Their astronomy.

The astronomical observations of the Egyptians appear to have commenced about fifteen centuries before the Christian æra; and there are many reasons to believe that the true theory of the solar system was farther advanced, with them, than with any other ancient nation. Pythagoras received from them a system, which though neglected for many centuries, Sir Isaac Newton eventually demonstrated to be the true system.

115. Their mathematics.

It remains, however, extremely mysterious, with respect to the Egyptians; as well as with respect to the early Chinese, and to the ancient literati of India; what was the genuine value of their mathematical science. Inferences from their astronomical acquisitions would make it extremely high; but a comparison of actual facts would reduce it. Thus, with respect to Egypt, and to India, it is known that both Thales and Pythagoras travelled into the one country, and the latter into the other, for the express purpose of obtaining science; and Pythagoras, with peculiar advantages in Egypt. Yet, it is also known, that the problem of inscribing a right angled triangle in a circle is claimed by Thales; and the equality of the square of the base of a rectangular triangle to those of the sides was an original discovery of Pythagoras, and the result of laborious research. Either, therefore, on the one hand, their minds were not sufficiently advanced to be capable of receiving that information when they were in

Egypt, or were not sufficiently candid to acknowledge it; or, on the other, the learned men of that country were unwilling, or incompetent to impart it. If unwilling, the communication of the sublimer truths of astronomical knowledge cannot be accounted for. It would almost appear that we have no real scientific astronomy before Cleomedes; and that the application of genuine mathematical science to astronomy commences with Aristarchus.

116. Their irrational superstition.

It is certain that the superstition of the Egyptians degrades them very low in the scale of intellect. A nation which could adopt so silly and ridiculous a mythology is scarcely entitled to be regarded as rational.

117. Their science referred to Chaldæa.

Josephus represents Abraham as not only assailing, with distinguished eloquence, the folly of their rites; but expressly ascribes, to the same patriarch, the communication to them of arithmetic and astronomy. Thus all the Egyptian learning, directly; and, indirectly, the sciences of Greece; are deduced from Chaldæa.

118. The scientific character of Greece.

As if the human intellect acquired dignity and strength, in its progression to the west, it is in Greece that ancient science appears in its acme of splendour.

119. The Greeks the first

Whatever might have been the attainments of their predecessors, on the theatre of nations; there is no satisfactory evidence that real philosophy

ever had an existence, among any people, anterior to the Grecians. philosophers.

The Greeks possessed, in the highest degree, the advantages which depend on language. 120. The Greek language.

A poor and restricted language is far from being an adequate instrument of philosophical investigation. The Hebrews had no term in their language to express an *eclipse*. What knowledge then could they have possessed in the sublimer branches of astronomy? Or what progress, indeed, could they ever have made? They could not express, otherwise than by a proper name, the distinction between a *god*, and a *goddess*. They indulged not, therefore, any great latitude of theological investigation.

In Greece, however, as in some other countries, knowledge had to contend with a formidable enemy; the fury, and the intolerance, of ignorance. Philosophy, unaided by Revelation, had approached very near to the discovery of the immateriality, and of the unity, of the Deity; when it was arrested, in its course, by brutal violence. Socrates was accused of believing in other gods, than those which the state had established; and, as if the state had a right to establish any, or had exhibited traces of wisdom in those which it did establish, for this transgression, which, if true, reflects on him the highest honour, he was doomed to death. 121. The religious intolerance of the Grecians.

Perhaps it was necessary, in the dispensations of Providence, that science, as well as religion,

should have its martyrs; and that the tree of truth should be nourished by their blood. Certain it is, that the Athenian people, like those of revolutionary France, at once fickle and sanguinary, soon repented of their cruel ferocity; and, by a transition, as sudden as it was extreme, almost adored that virtue, which, at first beyond their comprehension, was now placed above their imitation.

122. Grecian belles lettres.

The Greeks, early conscious of the powers of their fine language, directed its full energy on the cultivation of the belles lettres; and historical productions, as well as poetic compositions, which have challenged the admiration of all succeeding ages, were the result.

123. Mathematics and physics.

Nor were mathematical and physical science neglected.

In the former department, it still remains doubtful, whether it is rendering them sufficient justice to say, that they equalled the moderns; and whether they did not, in truth, surpass them.

One tribute must certainly be paid. The advances of the moderns, in the latter branch, the department of physical science, are due to the previous attainments of the Greeks, in the mathematical.

In the ensuing portion of this discussion the divisions of human knowledge will come under review, which were made by the most distinguished of the Grecian philosophers.

After the glory of the Grecian republics that of the Roman rose, in majesty, upon the world.

124. Scientific character of Rome.

The pride of the Roman people was restricted to their political superiority. Even in a poetical compliment to their character, distinct from this, no predominant feature could be seized. Willingly resigning to others the honours of philosophy, the Roman bard appears to claim for his country only that of military preeminence.

125. Predominance of the military feature.

"Excudent alii spirantia mollius æra,
"Credo equidem, vivos ducent de marmore vultus;
"Orabunt causas melius, cælique meatus
"Describent radio, et surgentia sidera dicent.
"Tu regere imperio populos, Romane, memento;
"Hæ tibi erunt artes, pacisque imponere morem,
"Parcere subjectis, et debellare superbos."

126. Evinced in a passage of Virgil.

"The subject nations, with a happier grace,
"From the rude stone may call the mimic face,
"Or with new life inform the breathing brass;
"Shine at the bar, describe the stars on high,
"The motions, laws, and regions, of the sky.
"Be this your nobler praise, in times to come,
"These your imperial arts, ye sons af Rome!
"O'er distant realms to stretch your awful sway,
"To bid the nations tremble and obey;
"To crush the proud, the suppliant foe to rear,
"To give mankind a peace, or shake the world with war."

127. Translation of the passage, by Mr. Pitt.

The Romans were indebted to the Greeks for the whole of their philosophy. They were late also in receiving it. Their early prejudices were entirely averse to the cultivation of an acquaintance with the Greek language. When science first began to be communicated to the Romans, the senate, alarmed at the prospect of innovations,

128. The Roman science derived from Greece.

by a formal decree, banished philosophers from the territories of the republic.

129. The Roman language.

The Roman language, though, like their national character, the most firm, perhaps, and majestic, of mankind, was ill adapted to the purposes of philosophy. It wanted flexibility. It was with extreme difficulty that it admitted the introduction of any new term. The Roman language subsisted for seven centuries without the word *moral;* and Cicero is obliged to make a formal apology for coining that word. The case was certainly an extreme one. A language must be poor indeed which is incapable of expressing the ideas of *morality*, *moral obligation*, *moral conduct*, *moral philosophy;* yet thus poor, and even in the age of Cicero, was the language of the Roman people. The most serious complaints are made by Seneca, by Lucretius, and by Pliny, of the penury and insufficiency of the Latin language.

This language is notwithstanding the repository of many noble works. Its poetry is exquisitely beautiful. The industry and manly good sense of the Roman prosaic writers are eminently conspicuous. It is a language which constitutes, at this day, the basis of five of the languages of Europe; one of which is also that of the Columbian republic.

130. Roman embassy to China.

The Roman history is entirely silent respecting an embassy, from that court to the court of China; of which mention is made in the Chinese annals. As the emperor Antoninus, from whom

the embassy is represented to have come, died in the year 161 of the Christian æra; and as the Chinese history states the arrival of the ambassadors in the year answering to 165 of the same æra; it must have required, at least, four years for the ambassadors, in that state of the world, to have performed the journey. In that interval an important revolution took place in the state of Parthia, to which country the embassy related. As the embassy appears to have been attended with no kind of success; as much time had been consumed, and two emperors were reigning, at once, in Rome, after the death of Antoninus; and as the irruption of the Tartars into Media, and the subsequent revolt of the Parthians from the Romans, may have intercepted the return of the ambassadors; it is possible that the subject entirely escaped attention, and more probable that no report of the results of the mission ever reached the Roman government. The Chinese name the Roman emperor Ong Toon; and stile him, *the king of the people of the western ocean.*

131. A passage from Lucretius.

The passage from Lucretius, exhibiting an impression of the recent origin of the world, will here be presented. The sentiments of the early Roman poet will be found precisely similar to those entertained by the primitive bard of the Hebrews; and evince, as well the universality, as the antiquity of the persuasion.

" Præterea, si nulla fuit genitalis origo
" Terræ et cœli, semperque æterna fuêre,
" Cur, superà bellum Thebanum, et funera Tröiæ,

" Non alias alii quoque res cecinêre pöetæ?
" Quò tot facta virûm toties cecidêre; nec usquam
" Æternis famæ monumenta insita florent?
" Verum, ut opinor, habet novitatem summa, recensque
" Natura est mundi, neque pridem exordia cepit.
" Quare, etiam, quædam nunc artes expoliuntur,
" Nunc etiam augescunt, nunc addita navigiis sunt
" Multa; modò organici melicos peperêre sonores.
" Denique, natura hæc rerum ratioque reperta est
" Nuper; et, hanc, primus cum primis ipse repertus
" Nunc ego sum, in patrias qui possim vertere voces."

132. Translation of the passage.

" If there hath been no original generation of " the earth, and of the heavens; if they have for- " ever existed, and are eternal; how is it, that " anterior to the Theban war, and to the destruc- " tion of Troy, other poets have chanted not other " transactions? How is it, that so many deeds of " men should so often have perished, and flourish " not on the immortal tablets of fame?"

" Of a truth the highest antiquity is stamped " with novelty; the birth of nature is recent; and " mankind have no remote ancestry."

" Wherefore, else, is it, that the arts are but " just receiving their polish; that they are only " beginning to multiply; that the extension of na- " vigation is but commencing; and that the me- " lody of music has but just been born?"

" Philosophy, only now, applies herself to the " developement of the nature and reason of things; " and I am myself among the earliest in explain- " ing them to Roman ears."

And here, in this historic review, leave must be taken of the people denominated the ancients; nations intervening Hindostan and the United States of America, which have entirely passed away, and are no more known upon the earth.

133. Necessity, in America, of closing the attention to the ancients.

In this expanded country, the mind intensely inquisitive, too little has been said, for those first arriving to knowledge, to introduce to their familiar acquaintance the fine nations of antiquity. For the mature and instructed mind what has been said is by far too much. In an epitomized view of ancient science a medium has been endeavoured to be observed. What has been immensely diffused has been attempted to be brought together. That which is certain, and universally admitted, has in general been taken; and that which is controverted and dubious omitted.

If the deluge has been insisted upon, it is because the most conclusive geölogical facts are but recent, and are yet little known in our country; and that that country furnishes many, and will still furnish more abundant, corroborations of that event. Bewildered in the rubbish of antiquity it is impossible for science to make any farther progress. It is indispensably necessary, and particularly in this country, to entertain prospective views; and, after having gleaned all that is important, to shut the door upon antiquity.

Enough appears to satisfy the American people that great intellectual attainments have characterized other nations; but it is hoped not so

much as to extinguish in their bosoms a present desire of equalling them, nor to preclude, at some future day, the bold expectation of surpassing them.

134. Review of modern science.

It will not, however, be proper to enter into a review of the divisions which have been made of human knowledge, and the arrangements which have been devised of the sciences, without adverting to the scientific character of two interesting portions of the globe; modern Europe, and the continent of North America.

135. Character of the Goths.

Nor can modern Europe be considered without regarding two singular people; the Goths, and the Arabians.

It is obvious, on a review of the political, the scientific, and the civil histories, of the nations of the oriental hemisphere, that, in reference to the people from whom civilization and learning have been derived, the savage state never had an existence.

It is, therefore, difficult to account for its existence on the ancient continent. Could it have originated solely from criminals and refugees, whose forfeited lives regular society would have exacted? Certain it is, however, that it did exist; and that civilized society has twice been its victim. In China it survived the shock, but in Europe it fell.

This event, of a subjugation of all civilized

society to a savage domination, can never occur, again, in the history of the world. The Columbian republic is the guarantee of America, and the Russian empire that of Europe. The acquisitions, which the human race may now make, will be retained, against every thing, but a physical change in the constitution of the globe.

In less than two centuries from their primary irruptions, the Goths subverted the vast and gigantic fabric of the Roman power; which so many ages had been employed in rearing.

136. Their cruelty, and contempt of learning.

The most afflicted and calamitous condition of the human race, on the pages of history, is that exhibited in Europe, in the interval between the destruction of the ancient civilization and the rise of the modern.

The civilized population was every where exterminated. No vestige was left of their policy, their jurisprudence, their arts, or their literature. New governments, new manners, new languages, every where arose.

It is impossible to depict the contempt for learning entertained by the barbarous population. They would not permit their children to be instructed in any science. The scientific character, as regarded by them, is essentially corrupt, enervated, depressed, destitute of courage. It comprehends every thing of meanness, cowardice, avarice, effeminacy, falsehood; and all other vices. Nothing,

in their view, but must bend before the dignity of ignorance and ferocity.

Their prisoners were tortured with an exquisite cruelty. Nor venerable age, nor softness of sex, nor infant innocence, nor dignity of office, nor the sanctity of the sacerdotal function, could mitigate their fury. They spared not the vine, nor the fruit-tree; and the edifice, which the flames could not destroy, they levelled with the earth.

They detested cities. They considered them the badge of servitude. Confinement, they argued, deprives even the fiercest animals of their spirit, and their courage.

137. The science of their druids.

Although among the Goths it was a settled maxim, *never to commit any thing to writing;* yet an exception, in some respects, existed. What the Persians termed a *magus*, the Goths denominated a *druid;* importing a particular class of men to whose charge was committed what had relation to religion and learning. These possessed great authority in all political transactions. They had an alphabet corresponding with the Phœnician; and the characters of which both Cæsar and Tacitus, perhaps, mistook for Greek. Some knowledge was also attributed to them which remains mysterious.

The centuries which immediately succeeded the subversion of the Roman empire, until the revival of learning in modern Europe, well merit the appellation of the dark ages. The human mind sunk into profound ignorance. Rapine, oppression,

turbulence, precluded every advance. Not a single author, of any merit; not one invention, useful or ornamental to society, appear in the long period of four centuries.

In the mean time science was cultivated by the Arabians. 138. The scientific character of the modern Arabians.

In the seventh century of the Christian æra a new religion, and a new political power, sprang up in Arabia; of which the rapidity of the progress, and the extensiveness of the diffusion, are equally admirable.

The conquests of the Mohammedans extended from the Atlantic ocean to the boundaries of China. Eventually repelled from Spain, they possess the whole of the southern and of the eastern coast of the Mediterranean; and almost a moiety of the northern. All the countries, so celebrated in antiquity, east of Italy, have fallen under their dominion. 139. Extent of their conquests.

Sir William Jones gives an interesting description of the personal qualities of the Arabians. He calls them a majestic race. Their apprehension is quick; their minds are always present and attentive. Their eyes are full of vivacity; their speech is voluble and articulate; their deportment manly and dignified. A spirit of independence appears in the countenance of every individual among them. 140. Their personal qualities.

Under the empire of the Caliphs science eminently flourished. What the Arabians principally 141. Their attention

to science.

regarded, in the literature of Greece and Rome, was not that which challenged the principal admiration of the learned of Europe; their fine productions of the imagination, adorned with the embellishments of chaste and correct taste. Possessed of a mythology more extravagantly wonderful, and their works of moral fiction abounding in a richness of fancy superlative and inimitable; their ardent minds regarded as frigid and unanimated the sublimest attainments of Greek and Roman genius. Insensible of any merit in the classic poets, or historians; they esteemed, with unbounded veneration, the discussions of philosophy. They translated the works of the eminent philosophers; and, directed by their light, applied their intellectual exertions, with enthusiasm, and perseverance, to the cultivation of the mathematics, of medical, and of astronomical science; to the construction of subtle and refined systems in dialectics, and in metaphysics.

142. Modern Europe indebted to them for certain sciences and improvements.

To geömetry, to astronomy, and to medicine, the useful improvements of the Arabians contributed not a little to impart their perfection. Modern Europe is indebted to them for the introduction into science of the arithmetical characters. The important sciences of trigonometry, of algebra, and of chemistry, owe, almost exclusively, their very existence to the Arabians; and their intrepidity first gave the bold idea of inoculating for variola.

It might be attended with consequences reciprocally beneficial if a more intimate communica-

tion of knowledge could be opened between that portion of Europe, formerly called Christendom, and the extensive regions over which is waved the magnificent Mahometan sceptre.

143. The rise of science in modern Europe.

The history of the rise and progress of science in modern Europe would constitute one of the most delightful subjects of contemplation to the human mind. Europe forms a peculiar community; and composes, almost exclusively, the republic of letters. The contributions to the common stock of knowledge, which have been made by each particular nation, industriously collected, and candidly presented, would form a very interesting and entertaining discussion. It is a task, however, which properly devolves on some of her own sons. The object at present in view is only to sketch the general scientific character of Europe, as regarded in the maternal relation to the United States of America, and the other inheritants of civilization and learning in the occidental hemisphere.

144. Profound ignorance out of which it arose.

The present knowledge of Europe arose out of such profound ignorance, that it is difficult to determine the exact time, or the exact cause, of its origin. Did the human mind, impatient of long and monotonous barbarity, spontaneously burst its fetters? Was it the religion of Europe, so favourable to the dignified expansion of the intellect, that nursed the plant of science? Was it the capture of Constantinople, and the expulsion of the erudite Grecians, that inspired the taste for letters? Was it the crusadal wars, or the Arabian literati; or the invention of the manufacture of

paper, or of the art of printing, or of the maritime compass, or of gun-powder and artillery; or the extension and activity of navigation by the discovery of America, and the circumnavigation of Africa; or, rather, the combined operation of all, that stimulated the European mind to those exertions which have been attended with such grand results?

In the commencement of the twelfth century Europe awoke from its protracted and death-like lethargy. At that period, kings, judges, dignified ecclesiastics, could not write, or read. So great a rarity was a book, and of such value the donation, that it was offered on the altar, for the benefit of the soul of the donor, and as an atonement for his sins.

145. The primary efforts misdirected.

Many of those who, in the twelfth and thirteenth centuries, were distinguished, in Europe, for proficiency in literature, were educated among the Arabians; and by them were instructed, for several centuries, almost all the men who were eminent in the sciences. The first acquaintance with the writings of Aristotle was derived from translations of his works out of the Arabic language, into which they had been previously converted; and, in the study of his philosophy the Arabian commentators were considered as the most skilful and authentic guides. These commentators refined on the metaphysical and frivolous subtlety which characterizes that philosophy; and, imparting a misdirection to the primary efforts of the European mind, retarded the progress

of true science. Genius was wasted in speculations both difficult and unavailing.

146. The results notwithstanding favourable.

The intellectual faculties were, however, excited by the novelty, and exercised by the boldness, of these arduous and uninviting speculations, so remote from genuine philosophy. Colleges and universities were erected, regular plans of study were pursued, privileges were conferred both on preceptors and pupils, academical honours were devised; and superiority of science, leading to reputation and authority, became an object of high respect in society.

At length a Des Cartes, a Bacon, a Leibnitz, a Newton, a Linnæus, a D'Alembert, a Lavoisier, and a host of heroic cultivators of science were produced, who have carried the human intellect to the summits of fame; and whose exalted attainments almost preclude to future times the hope of equalling them, and much less afford room for the expectation of their ever being surpassed.

147. Distinction of Great Britain.

In this noble and generous career of intellectual exertion the great nation, with which the Columbian republic was formerly connected by political ties, has sustained a distinguished and a brilliant part.

148. Natural philosophy the peculiar child of modern Europe.

The science of natural philosophy is almost peculiarly the child of Europe. In no ancient nation can it, perhaps, be strictly said that it even existed. And, out of Europe, and European establishments, can it be strictly said, that, any where,

the true science of natural philosophy, even at this day, exists?

149. Obligations of mankind in general to modern Europe.

How much is America, how much is the human mind at large, indebted to Europe for her invaluable acquisitions! What science is there, either useful or agreeable, that has not been opened and explained by those sons of industry? Their labours have smoothed all the rugged paths which conduct to the temple of knowledge. No species of learning is there, either beneficial or alluring, of which the rudiments have not been investigated, and the asperities softened, by their vigilance and perseverance. The barriers which ignorance and prejudice had erected have been battered down. The doors, which, so long kept closed, had concealed the recesses and adyta of the temple of science, have been burst open. The various classes of society have been brought together. Communications have been opened, and rendered easy, between them; while the hands of elegance and refinement have strewed the way with flowers. No subject has been too high to defy their approaches; none too low to escape their penetration. The acclivity has been climbed, the precipice descended, the dark cave explored; and, in the service of science, nor time, nor toil, nor health, nor peril, nor gold, nor life, has been spared.

150. The scientific character of the United States of America.

Particular circumstances have rendered it difficult, not only for the inhabitants of Europe, but even for their own citizens, correctly to appreciate the scientific character of the United States of America.

In order, in some degree, to remove the ambiguity, it will, perhaps, be necessary to draw a distinction, which may serve to elucidate, in general, questions respecting literary character.

151. Distinction made between exegetic and zetetic science.

The state of knowledge, in any country, may be considered under a double aspect. They may be termed the *exegetic*, and the *zetetic;* the first expressing the degree, and the extent, in which the attainments already made by the human mind, are explained to, and comprehended by, the inhabitants of that country; and the second indicating the disposition to ulterior investigations, and the capacity of advancing science beyond the stages to which it had previously arrived.

152. America superior to Europe in exegetic science.

Under the first aspect the United States of America are justly entitled to the foremost rank among nations. A greater variety of knowledge is presented to, and received by, their inhabitants; and a greater number of persons, in the ratio of their national population, are possessed of general information, than among any other people. Belles lettres, mathematics, philosophy, medicine, arts, government, tactics, history, religion, by the great mass of the people, are more freely investigated, and more fully understood, than by any other nation on the earth. This precedence applies both to ancient, and to modern times.

153. Europe superior to America in zetetic science.

It is only then in the zetetic aspect that dubiety exists; and here we must yield the palm to the industry, and to the advantages, of the European nations. In Europe a greater proportion of

persons apply themselves to make philosophical discoveries; and a greater number of discoveries might be said to be actually made; and the discoveries made might, without impropriety, be asserted to be more important; if the real truth were not *that America has made but a single philosophical discovery*. That, however, must be admitted to be one of the most important and sublime, which has ever been accomplished by human genius. It is the discovery of the identity of lightning and electron.

154. Europe superior to America in general scientific character.

In many European nations, too, philosophical investigation is a part of the care of the state. Many persons are placed in profitable and dignified situations to prosecute discoveries in science. Many superb institutions are established and maintained by the government. Hence anatomy, astronomy, botany, chemistry, navigation, the arts, are enriched with a great variety of objects and materials. All that is rare, and curious, and precious, is collected; and system, and skill, and resources, are boldly, and liberally, applied. Of all the results, so soon as obtained, we enjoy the full benefit; when, at the same time, we could not of ourselves have produced them. While, therefore, in the exegetic department of science, from the labours of the learned of Europe we derive an equal, if not a greater, benefit than the inhabitants themselves of that quarter of the world; in zetetic science we do not sustain even an equitable proportion of the burthen. The general scientific superiority must therefore, unquestionably, and with the strictest justice, be assigned to Europe.

How soon America may change this state of things is not very certain; or when, if ever, she may be capable even of inverting it. It would be presumptuous, from any thing which has yet appeared, to imagine that America may acquire the superiority, and impart to Europe scientific nutriment.

155. America may, however, change that state of things.

Yet, it is impossible to foretell events. We are a very young nation. The revolutionary, and the andrapodistic wars have but just established our physical power. We can now no longer be injured by the nation which has injured us most. There is no ground of apprehension that the spirit of the American people will be humiliated in arms; either on the land, or on the water. Nor need a fear be entertained, while the liberty of the press remains, that our incessant discussions will embroil our interior peace. An emulation to excel other countries in science, as well as in arts, will be progressive.

If the introduction of a personal consideration may be pardoned, I will avail myself of this opportunity to confess, that my resolution, in the prosecution of the present enterprize, has been greatly sustained by the hope, that it may have a tendency to elevate the scientific character of my country.

156. Effects anticipated from the present enterprize.

If the principles, on which this enterprize has been conducted, should prove to be solid; if the present attempt should not only be well received, but its object be cherished, and become national;

if, in short, Europe should, eventually, accept her scientific distribution and nomenclature from America; for the course of action is not purely optional, but that system which possesses the intrinsic superiority must ultimately triumph; the heavy debt of gratitude, which the western hemisphere owes to the eastern, will be, in some degree, lightened.

157. The grand destiny of America.

America is, in fact, by no means aware of the brilliancy of her destiny. The dormant beauty, unconscious of the gradual expansion of her form, the graceful majesty of her person, and the growing energies of her understanding, is not yet sensible of the destined transformation to the virtuous mother, and the accomplished lady; the ornament, the pleasure, and the pillar of society. America is the pride and the hope of mankind; and there is not a scientific, or a truly enlightened and philosophical mind, in all Europe, which will not respond to the assertion. Such minds universally, cordially, and sincerely, wish us success. In thought, the subjects of the European princes are as free as the princes themselves. Those of their subjects, who are characterized by intellectual elevation, think for us, and think with us; and desire to imitate us. With the requisite circumspection in their conduct, the American republics will become models for future ages, and for distant regions.

158. The prophecy of Bishop

So profoundly impressed with the grandeur of the destiny of America was a distinguished Britannic prelate, when, by a visit to this conti-

nent, his judgment, naturally vigorous, was enlightened by personal observation; that he could not resist what he deemed a prophetic impulse. The celebrated Bishop Berkely wrote, in America, at Newport, in Rhode Island, in the year 1731, the following prediction of the future splendour which was destined to distinguish the occidental hemisphere. Berkely on that subject.

> "Westward the course of empire bends her way,
> "The four first acts already past,
> "A fifth shall close the drama with the day;
> "Time's noblest offspring is the last."

Thus has been rapidly, and imperfectly traced, the progress and advancement of the human mind, in the various countries of the world, and in the different æras of history.

159. The systems of human knowledge.

The object next in course is carefully to collect, and candidly to exhibit, all the systems and classifications of knowledge which have been formed; either in ancient, or in modern times.

In pursuing this branch of the subject it will be obvious that it is by no means necessary to enter into a very minute and protracted criticism of every system. A good system, when once devised, will necessarily supersede all others; and, by becoming itself a standard, will serve as the test of others, the merits of which will be determined by their approximation to, or their departure from the principles, on which that is constructed which, if not perfect, is at least the most satisfactory.

It will, however, be attended with essential advantage to direct the attention to the prominent beauties, or to the intrinsic deficiencies, of any system which aspires to the arrangement of all human knowledge; and particularly to those which are entirely original in the principles of their construction. That which avoids most of the defects contained in others, and combines most of their advantages, will possess the greatest likelihood to be correct and useful.

160. The Chinese system.

The most ancient system of human knowledge, in point of fact; though among the most recent, in arriving to the cognizance of the western nations; is that on which the Chinese Encyclopædia, which has been already adverted to, is constructed.

The antiquity of this system is indubitable; though, at this distance, and with limited means of information, it is not possible to determine it to a particular year. The Chinese annals would themselves assign it to the emperor Whang Tye, in the year 2637, anterior to the Christian æra; but then those same annals show that the manner of denominating, and of computing, what is susceptible, in western languages, of translation by no other term than that of *year*, had varied no less than five times in that interval; and, as it is the nature of such a work to be progressive, it may be inferred, that, though the antiquity is unquestionably high, yet the precise date cannot be exactly ascertained, in a different chronology; and that the contents have not been always the same, though the

principles of their arrangement may have been uniformly adhered to.

161. Its divisions.

The Chinese Encyclopædia is founded on the division of all human knowledge into two great provinces or departments. The first of these comprehends every thing which has relation to the spiritual world. The second embraces the material universe.

The spiritual world is divided into three great departments. The first of these is occupied by the Supreme Being alone. Spiritual intelligences, directly existing as such, and which have never been united to bodies, constitute the second department. The third is composed of spiritual intelligences which have once been the souls of virtuous men, and have been united to their bodies; now existing near to the Deity, separate and purified from the animal frames in which they had before resided. The second department comprehends a variety of grades and orders.

The material universe is distributed also into three great departments. The first includes every thing which relates to celestial objects. The second embraces the earth; and the various objects it contains, unconnected with human beings. The third comprehends man; and every thing which relates to human concerns, and human happiness.

162. Its beauties and defects.

The second of these branches, that relating to the earth, and to the objects it contains, is so extremely defective, when contrasted with the

science of Europe; so marked, in most of the subjects, with profound ignorance; and, in many, exhibiting, at the same time, the evidences of obstinate and unreasonable conceit; that it will, by no means, merit a particular attention.

It is widely different with respect to the two other branches. That relating to astronomy, and celestial phænomena, is especially constructed on a simple, clear, and elegant analysis. The manner of representing a constellation is, in some instances, characterized by a greater degree of good sense than the European. Small circles, representing stars, are connected by straight lines drawn from one to the other, to form a constellation, instead of grouping the stars, intended to be comprehended in a constellation, into the figure of an animal, or some other object, and thus filling the material heavens with a variety of imaginary beings. One error seems to exist in the Chinese astronomical science. The five planets; for those of modern discovery are not known to them, and they do not count the earth as one; though clearly and truly recognized as planets, are considered, like the fixed stars, as bodies shining by an inherent luminosity, and not by derivative or reflected light.

The Chinese moral philosophy, which composes the principal part of the third and last branch, relating to man, and to human affairs, is a very elaborate system. An accuracy and a minuteness is aimed at, and even attained, which is entirely unknown among other people. It would

of course appear, in their eyes, fastidious; and, in many respects, frivolous. It possesses, however, two qualities which will be great recommendations to it, with a people, viewing extrinsic habits and opinions in the same liberal manner as those of the United States of America; strict equity, and expanded philanthropy.

It may be regarded as one defect in the Chinese Encyclopædia that it is not sufficiently comprehensive. It appears to contain no mathematics; and little, or no belles lettres. The history is partial, and imperfect; and the arts appear to be entirely pretermitted.

The analysis, however, making due allowance for the materials on which it operates, is very exact and elegant. It is founded in the nature of things as they exist, exterior to the mind; and, though many mistakes occur in the arrangement of the materials which compose the subordinate departments, they are evidently the result of defective knowledge in the details, and not of the want of strong comprehensive and analytic powers in the intellect applied to the investigation of them.

It may be remarked further, that the Chinese are the *first*, and the *only nation*, who have ever been able to construct an encyclopædia, *on any analysis whatever of human knowledge.* All others are founded on an arbitrary arrangement.

163. Represented by

They represent the system, very handsomely, to the eye, in a drawing. Two circles, one above

a drawing.

the other, indicate the two great provinces of the intellectual and material world. The first of these, divided into one large and two small sections, designates the divine nature; with the spiritual beings of the higher orders on one side, and sanctified souls on the other. An omnipotent effluence proceeding from the Deity, gives rise to the principle of matter; which is considered in two relations, either as at *rest*, or as in *motion*. The lower circle representing the effects of the omnipotent effluence on the material principle, in its two distinct states of rest and motion, is divided, by an inscribed equilateral triangle, resting on its apex, into three compartments; of which the superior designates the heavens, and the two collateral, the earth, and man. Three broad concentric circles, inscribed in the equilateral triangle, comprehend primitive matter, and the two modifications of rest and motion. The omnipotent effluence, according to the theory, operating on the primitive matter, and successively producing rest and motion, gives rise to all the phænomena of the material universe. Without that divine effluence, incessantly operating, matter could produce no effects whatsoever of itself. Some mythology is superadded, which it is unnecessary to pursue. The principles of the division are perfectly intelligible, considered separately from the theory and mythology with which they are connected.

164. Extent and merit of the

This encyclopædia contains, in fifty-two volumes, a succession of treatises on the several sciences, arranged in the order of the Chinese

analysis of human knowledge; and illustrated with figures, or engravings. Mr. Abel-Rémusat, of Paris, considers it a work of the greatest utility; and proposes to give, at some future day, an analysis of it, and the most interesting parts of the geography, the biography, the natural history, and the botany. Le Pére Amiot had previously exercised a great deal of labour and perseverance in obtaining a comprehension of its principles; and Doctor Hager, among his various productions on Chinese literature, recently published at London, at Paris, and at Berlin, speaks of it in a respectful manner. Chinese Encyclopædia.

Zoroaster, who has been already mentioned, is considered as the distinguished founder of the Persian philosophy, religion, and learning. 165. The system of Zoroaster.

Eusebius, the bishop of Cæsarea in Palestine, in his evangelical preparation and demonstration, quotes, from the writings of Zoroaster, a passage on the nature, and the attributes of the Deity, with a marked approbation of his theology. The credenda of his religion were simple, and few; free from the multiplicity and perplexity prevailing in others. The ethics of Zoroaster have been much admired. Of all virtues he esteemed most what the Grecian philosophers denominated *philanthropy;* and what the apostolical writers term *philadelphia*, or *brotherly love.*

The whole mass of Persian science was designated by the term *magia*, importing all the learning and doctrines of their *magi*, or *philosophers;* and from which radix the modern word *magic*,

though deviating in its direct import, has been deduced. The details of the Persian religion and philosophy are contained in an ancient work, ascribed to Zoroaster, under the title of the *Zendavesta.*

The Zendavesta was originally written, in the old Persian character, on twelve hundred skins of vellum. It is divided into twenty-one successive treatises. Zoroaster inculcates, on all his successors in the office of priest, to render themselves perfect masters of all useful learning; and himself exhibits, not only the religion, but all the science of the magi. One of the treatises is devoted to his personal biography; in which are fully displayed the mysteries of his prophetic character, and the methods made use of by him for the propagation of his religion. Another of the treatises is appropriated to the science of medicine. Others were assigned to physics and natural history, to astronomy, and to agriculture. Part of them embrace poetic and historical compositions. The first great department into which *magia*, or all human learning, would appear to be divided, is theological knowledge. It would be dubious, from the explanations, whether the second comprehended more than medicine; though, in a more enlarged acceptation, it might embrace all physical science.

166. Hermes.

Titus Flavius Clemens; one of the Christian fathers, who is generally designated from his place of abode, Alexandria in Egypt, in order to distinguish him from Romanus Clemens, another of the fathers, who was the companion of Saint Paul, and

became afterwards bishop of Rome; flourished in the year one hundred and ninety-one of the Christian æra. He is the only writer who has been the medium of handing down to these times the number and contents of the books attributed by the Egyptians to their Hermes.

The Egyptians venerated the memory of Hermes, as the original inventor of alphabetic characters; as well as of the secret and mysterious hieroglyphics used by their priests.

According to Clemens of Alexandria, the works of Hermes consisted of forty-two books. They were distributed into six sets. The first set comprized only two books. Of these, the one contained hymns to the gods, and the other, rules for the observance of the king. Four books, entirely devoted to astronomical science, composed the succeeding class. The first treated of the fixed stars; and the three following related principally to eclipses, and to the rising and setting of the sun, and of the moon. Language, belles lettres, geögraphy, natural history, and some associated objects, constituted the subject of ten books, in the third set. Ten other sacerdotal books, of the fourth set, embraced every thing which appertained to the Egyptian religion. The administration of that religion, and of the government; jurisprudence; the discipline of the priesthood; were contained in ten following books; and anatomy and medical science were comprized in six others; amounting altogether to forty-two, and constituting a voluminous and a diffusive encyclopædia.

167. Pythagoras. It is a point of time, infinitely interesting in the contemplation of the American mind, when science first traversed the Ægean sea, and made its primary entrance into Europe.

Anterior to that period all is obscurity and mystery. Clearness and certitude mark its subsequent progress.

From the fountains of Indian, Persian, Chaldæan, Phœnician, and Egyptian learning, the Grecian sages derived their primitive knowledge.

The writings of Hermes are tinctured with the philosophy of Zoroaster; and Thales and Pythagoras drank deep at these primæval springs.

168. His travels. To Pythagoras appertains the honour of the introduction of science into Europe. His father was an opulent Phœnician merchant, and bestowed upon his son a finished education. Early imbibing an insatiable love of knowledge, his whole life was devoted to its acquisition, and dissemination. Stimulated by a victory obtained at the Olympic games, in Greece, he determined on setting out from the island of Samos, where he had originally settled, to travel through the world, in pursuit of knowledge.

Aware of the dangers, and of the mortifications, which, in that state of the world, must attend the execution of such a design, the bosom of Pythagoras was fortified both by intrepidity and by patience; and his first voyage was directed

to Sidon, the place of his nativity. After the acquisition of the mysterious rites and sciences of Phœnicia, his travels were turned to Egypt. There he continued, during a period of twenty-two years, with unexampled perseverance, and under a discipline, of which the severity was purposely enhanced by the jealousy of the priesthood, to imbibe the streams of knowledge. That he might more rigidly conform to the dogmata of the haughty hierarchy of Egypt, and leave unexplored no portion of their recondite sciences, he submitted to the rite of circumcision, and to a quinquennial probationary taciturnity. Recommendations from the prince of Samos procured him the favour of Amasis the monarch of Egypt. The patronage, the power, the influence, of the king; his personal firmness, abstinence, modesty, docility; at length induced the priesthood to relax their established rule of, in no instance, permitting to be divulged to a stranger the sacred arcana of their philosophy. He was gradually transferred from Heliopolis to Memphis, from Memphis to Thebes; was instructed in the mystic principles of their theology, and admitted into the inmost recesses of the temples. It was during this long residence, this obscure seclusion, this arduous probation in Egypt, that Pythagoras attained his eminent proficiency in astronomical science; and his intimate acquaintance with the elementary principles of geömetry.

The aggregate of Egyptian wisdom could not saturate the scientific avidity of Pythagoras. He had heard of the Chaldæan, and of the Persian

magi; and the renown of the venerable Brahmins of India had reached his ear. He was impatient to explore their hallowed caves and consecrated groves. At this period he fell a victim, with the inhabitants of Egypt, to the vindictive ferocity of the Persian monarch; and was transferred with other captives to Babylon. The Chaldaic magi, at the Assyrian metropolis, received with ecstacy, the adventurous son of science. Here he met with the learned Hebraic prophet Ezekiel. Here were unfolded to his view new sources of learning. Additional application, for a period of twelve years, in that celebrated capital, invested him with the astronomical acquisitions, in which its inhabitants so eminently excelled. An excursion to India terminated his researches; and he returned to Europe, to impart to a barbarous and unthankful people, all the literary treasures of Asia.

169. The first philosopher.

Anterior to the time of Pythagoras, the whole mass of what could be taught and known had no other name than that of *mathematics*. This term, which is derived from a Greek verb signifying *to learn*, had not, in its primary use, that restricted import which it afterwards obtained. It comprehended every thing that could be learned; and therefore, of course, every thing which was capable of being taught. The acquisition of the whole mass of human learning, in its most refined state, at the existing age, entitled its possessor to the appellation of *sophos*, or *sage*. A superiority of attainments leading only to superior modesty, a less assuming epithet could alone satisfy the mind

of Pythagoras. He, therefore, first introduced the term, *philosophos;* importing, not a *sage*, but only, *the friend and admirer of the sage.* To have acquired human knowledge in its most extended ranges, and its most exalted stages; and wisely to apply the learning thus obtained, in a life of piety, and virtue; constitutes what has ever since, until very lately, been honoured with the appellation of *philosophy.*

170. His system.

Mathematics, then, the only term in use, at that æra, to designate the whole compass of human science, were elegantly divided by Pythagoras into two great departments; having for their bases, respectively, the subjects of *number* and of *magnitude*, and subdivided by a reference to the contingency of their being either at *rest*, or in *motion.* Number, at rest, constituted the science, or art, of arithmetic; and, regarded as in motion, was the foundation of that of music. In like manner, magnitude, at rest, became the subject of the art or science of geömetry; and considered as in motion afforded the basis of the sublimer branch of astronomy. Four *sciences* only, or as in those days they were denominated four *arts*, embraced the whole range of human knowledge; under the appellations, respectively, and in the order of, *arithmetic*, *music*, *geömetry*, and *astronomy.* From these four original and primitive sciences have sprung all those which now decorate the long and splendid list of human attainments; and we shall soon find the interesting catalogue enlarging itself under the auspices of the ingenious Aristotle.

171. Plato.

Plato combined all the learning both of Pythagoras and of Socrates. Like the former he visited foreign countries, and particularly Egypt and Phœnicia. His genius possesses a lasting monument in his writings; which have, fortunately, been transmitted to the present times, without essential injury. A *native* of Europe, he may be almost regarded as the first of her philosophers.

172. His system.

The philosophy of Plato was divided into three great and principal branches; under the denominations, respectively, of, *theology*, *physics*, and *mathematics*. It is not to be doubted that what afterwards received the name of metaphysics, was, as well as ethics, comprehended in the first term. The boundaries between the second and third remain indefinite. It is not certain whether astronomy, or music, were intended to be transferred from the branch of mathematics, into that of physics; or whether the former department retained its integral character, and was considered under the arrangement imparted to it by Pythagoras. Nor is it certain, either, how much, or what was comprehended, in the department of physics. Certain it is, that the four sciences of the Pythagorean school survived the age of Plato; and had not yet received an extended enumeration. The merits of the Platonic division of human knowledge will, in a subsequent stage of this discussion, be contrasted with those of Mr. Locke; and the system will be noticed, in its order, to which the combination of the Platonic philosophy with the principles of Christianity gave rise, at the æra of the gnostics.

173. Its defects.

It was one of the faults of the mind of Plato that he attached an extravagant value to some departments of knowledge, while at the same time, he divested others of their legitimate importance. Geömetry was an especial favourite. A monition on the portal of the academy inhibited the entrance of him who was not a geömetrician. The divine mind he represented as always geömetrizing. Physical science, on the contrary; to which geömetry, strictly speaking, is merely the auxiliary; was greatly depreciated in the estimation of Plato. Intelligible forms, images, or ideas, constituted the universe. These alone were invested with the qualities of permanency and immutability. Knowledge could consist alone in the exercise of the intellect in the abstract contemplation of these forms or ideas. Every thing else was mutable and fluctuating. The most diligent study of the visible world could yield nothing better than opinion. In the nature of things there may be, and unquestionably is, a real certainty; but every thing is uncertain to the human understanding. The most exalted science, which it is in the power of man to attain, in relation to the material and visible universe, can never ascend higher than bare probability. It would have been ever impossible for natural philosophy to have formed any part of such a system of physics.

174. Aristotle.

If, from the annals of humanity, a selection should be made, of the individual who might be presumed to have carried to the utmost degree the intensity and acumen of intellect; the honour

of that preference would, perhaps, be attached to Aristotle.

The productions of Aristotle have enlightened the human mind in one age, and renovated it in two others. Their variety, and their perfection, amaze the imagination. Chastity of stile, lucid order, pregnant brevity, characterize the whole. From the same materials no genius could have extracted comparable results.

175. Three systems. No less than three distinct divisions of human knowledge may, perhaps, be attributed to Aristotle.

176. One in the subjects of his writings. The various subjects on which his discussions turned may be considered as embracing almost all the ranges of human investigation. Rhetoric, poetry, logic; ethics, politics; mathematics, natural history, physics; the intellectual world; all the regions within which the understanding of man had roamed, and almost all into which it could possibly soar; employed, without exhausting, the profound and brilliant talents of Aristotle.

177. Another in the categories. A second division of human knowledge may be conceived to exist in the categories, which form a part of his system of logic. The categories are intended to constitute a classification of all the possible objects of human thought; or at least of all the possible objects of human speech; so that no sentence could be uttered, or written, containing a verb, and therefore containing an assertion, which may not be reduced under some

one of the categories. They are not strictly speaking the invention of Aristotle; for they pervaded all the systems of logic anterior to his time. It is probable, however, that they received from his hands their greatest perfection; though they vary little, if at all, from the enumeration of Archytas, a Pythagorean philosopher of Tarentum in Italy, as contained in his treatise concerning the universe. They are reducible to ten. Substance, quantity, and quality, form the first three; and are perfectly clear and intelligible. Place, time, relation, may be considered as those immediately succeeding. Action and passion, situation and habit, complete the catalogue. It might be necessary to illustrate some of the latter, if the subject were not here entirely collateral. Mr. Hume has attempted to establish different categories. From this circumstance the editors of the Edinburgh encyclopædia, in their preface to that noble work, have made a surprizing inference. They conclude, as their predecessors D'Alembert and Diderot had previously concluded, though from entirely different premises, that a correct division and classification of human knowledge can never be made; and represent the attempt as vain, and presumptuous. Without arresting the attention on the main question; the perfection of the categories of Aristotle, or of those of Mr. Hume, in relation to the subject to which they appertain; how has the previous question been thus conclusively determined that a classification of science ought to be founded on the categories? Neither Aristotle nor Mr. Hume make this assertion. On the contrary, both of them have made

divisions of human knowledge, entirely, unconnected with the categories. It is true Dr. Verdier, of Paris, in his observations on "the perfectibility of man by physical and moral agents," contends that a classification of the sciences ought to be founded on the categories; and makes some acute and critical reflections on the celebrated table of the sciences prefixed to the great French encyclopædia. The discussion of Dr. Verdier, it is believed, is not accessible in America; and the merits, therefore, of his system, or the weight of his arguments in favour of categories, cannot be fairly tested. The categories in logic would prove as unstable a foundation on which to erect a structure of universal science, as, in grammar would be the several parts of speech; and it might even be said as would be the digits of arithmetic. All are necessary instruments, which the mind employs; but it applies every one to all kinds of knowledge indiscriminately, and no one affords any principle for the classification of that knowledge. A classification of human knowledge, founded on no better principles than those to be derived from the categories of logic, would present a mere play upon words; divested of all dignity, and unattended with the smallest degree of utility.

178. A third in the text of his discussion.

In the text of Aristotle there is contained, in a very few words, and those entirely incidental, a very elegant and masterly attempt at a complete general division of human knowledge. According to the principle there unfolded, all truths, ascending by induction, would be referred to three great and distinct faculties of the human soul; the *un-*

derstanding, the *imagination*, and the *volition*. The truths coming under the cognizance of the human *intellect* would therefore be divided into three correspondent branches; and would be either, *theoretical*, *poetical*, or *practical*. This division must necessarily be hereafter contrasted with that of Lord Bacon. It will be found in the first chapter of the sixth book, of what the commentators of Aristotle denominate his *metaphysics;* a term, however, which was never used by the author himself, and which had not, at his day, been introduced into language. The original terms, containing the principle, and of which the translation has first been given, are the following. "Ἁπασα διανοια, ἡ πρακτικη, "ἡ ποιητικη, ἡ θεωρετικη."

179. Arranges a library.

Strabo asserts of Aristotle, what would be not in the slightest degree incredible, that he was the only man who was ever able to arrange the books of a large library, in an orderly and systematic manner; and that he executed this task for the king of Egypt.

180. Adds three specific sciences.

The labours of Aristotle produced the addition of three specific sciences to the four which had been previously established by Pythagoras. All of these had their base in human language. They were termed, respectively, the *grammatical*, the *rhetorical*, and the *logical* arts; and they took the precedency of the four Pythagorean sciences, or arts. Thus the number of the specific sciences became increased to seven. In the language of scholars, the four sciences of Pythagoras were distinguished by the name of the *quadrivium*, sig-

nifying the concentration of four roads; and the three introduced by Aristotle were, in like manner, denominated the *trivium*, a coincidence of three paths, or ways.

181. The encyclopædia of the ancients.

The Greeks stiled a complete course of instruction in these seven sciences, *cyclopædia*, the circle of education; and, combining the augmentative preposition, *encyclopædia*, the great or enlarged circle of education. It does not, as is believed, directly appear that a great work or composition was in existence unfolding, in their succession, all these sciences; and thus resembling a modern *encyclopædia*. The Greeks, and their successors the Romans, had not advanced as far, in this respect, as the Chinese. Yet, as the sciences were universally taught in this order; manuscripts, notes, and what would be equivalent to heads of lectures, must have abounded in the hands of those charged with the trust of education.

182. The *artes liberales* of the Romans.

The Romans stiled these sciences *the liberal arts;* and the acquisition of them was regarded as the indispensable foundation of an intellect, cultivated and accomplished. This distribution of the sciences into seven has descended to modern phraseology; and a Latin verse serves as the aid of the memory, in recollecting, both their number, and their succession.

"Lingua, tropus, ratio; numerus, tonus, angulus, astra."

Grammar, rhetoric, logic, arithmetic, music, geömetry, astronomy, translate the verse; and, while they present the expanding catalogue of the

sciences, exhibit the rudiments of established nomenclature, with radices entirely Greek.

183. Chasm of twenty centuries.

From the æra of Aristotle; complimented by the ancients, as the secretary of science, and of nature; down to the time of the Lord Chancellor Bacon of Great Britain, a chasm exists, with respect to scientific classification, of nineteen and a half centuries. During this long and gloomy period scarcely a scintilla gleams on the profound obscurity.

What little can be collected will, however, be presented.

184. The departments of the nine muses afford a distribution of the sciences.

The mythology of Greece represented Apollo as the deity of science, and as presiding over nine celestial ladies; to whose charming patronage were confided its several departments. It will soon, on examination, be perceived; that, in the distribution among the muses, of the several subjects of taste and science, neither precision in the division, nor the dignity of the object, were consulted. A single muse has the charge of astronomy, and of astronomy alone, and her jurisdiction is exclusive; admitting no interference from any of her sisters. But the case is exactly the same with respect to dancing; and, of Terpsichore and Urania, neither will to the other yield the claims of rank. While history has, like astronomy, but a single muse, the histrionic art claims two; the oratorical department two; and the poetic lyre no less than three. The dignity of history, the majesty of tragedy, properly engross the undivided

cares of Clio and of Thalia; but Calliope and Melpomene divide eloquence and rhetoric; and Euterpe, Erato, and Polyhymnia, separately claim poetry, as its object is, respectively, either heroic, or amorous, or religious. The provinces of the nine muses comprehend of human knowledge much that is serious, and all that is agreeable; but do not amount to an accurate and satisfactory scientific classification.

185. The Romans made no additions to the sciences.

The Romans appear to have added nothing to the number; and little to the bulk, and the volume of the sciences. They received them entirely from the Greeks; they were tardy in the reception of them; and they did not grow in their hands. What specific science, what single discovery in philosophy, is to be attributed to Rome? Is not, in reference to science, her career a nullity; and a blank her history? It may be easy to respond to the interrogation, if Cicero was not the first of her philosophers; but is it much more difficult to answer the inquiry, if he was not her last?

186. Porphyrius.

Porphyrius, the decided enemy of Christianity, to whom seven answers were written, some of which are preserved, while the original production has itself perished; whose discussion, in exciting those answers, has the merit of handing down to us the few fragments which we have of the learning anterior to that of the Greeks; is spoken of as having made an arrangement of knowledge. He was an eminent Platonic philosopher, the disciple of Longinus; and himself a very distinguished and much admired writer. As

taste, in those days, fluctuated, as opinion varied, and as power alternated, the memory and productions of adversaries were doomed to destruction; and vindictive deflagrations successively deprived the world of some of its finest literary monuments. On these principles acted the enemies of Diocletian, and the friends of Theodosius; and the writings of Porphyrius were victims to the resentment of the latter. Free, and full, and fair investigation, is always favourable to truth. Restricted discussion can be of service alone to error. The most certain mode of confirming the mind in any belief, when reason is cultivated and strong, is by admitting the contrary to be freely maintained. A perfect and rational conviction may then be assailed in vain. Imbecility of intellect, and imperfect belief, lead to violence and persecution. Eusebius acted with more judgment and virtue, in refuting by the vigour of argument and eloquence, the vain reasonings of Porphyrius, than Theodosius in condemning them to ignominious exustion. It is the argument of an Omar, and may be more serviceable to error, than to truth.

187. His tree of knowledge.

Three distinct works were written by Porphyrius on the categories of Aristotle, fragments of which, it is believed, are preserved; but which, my researches have not been able to reach in America. The reverend Gabriel Richard, pastor of the Roman catholic congregations of the territory of Michigan, informs me that when he was at college at Angers, in France, a tree ascribed to Porphyrius was a subject of discussion; which he believes contained a systematic division of

human knowledge. An interrogation, in the fourth volume of the works of Pope, demands, *if the arbor Porphyriana be the tree of knowledge of good and evil?* That an object of this description, therefore, exists, is certain; but respecting its nature, and its merit, I am utterly unable to gratify the curiosity of my auditor; and this cursory reference to it, in the enumeration of the classifications which have been made of science, must suffice to invite to it the attention, if of attention it is worthy, of those who are favoured with superior advantages.

188. The Gnostics. While, on the one hand, among some of the Platonic philosophers this animated hostility to Christianity obtained, either its principles were, on the contrary, received by others, or some of the professors of Christianity were disposed to combine its doctrines with the tenets of the Platonic school. From this combination of Christianity and Platonism sprang the sect denominated the *gnostics;* and sometimes distinguished as *platonizing Christians.*

The philosophy of the gnostics is here introduced on no other account than as containing a very elegant, and at the same time a very correct division, of the different kinds of being which enter into the constitution of the universe.

189. Their principle of the *hylic*, *psychic*, and The gnostics divided nature into three distinct kinds of beings or existences; the first the *hylic*, or material; the second the *psychic*, or animal mind; and the third the *pneumatic*, or spiritual

being. The precision and the advantages of this distribution will appear, with more clearness, in a subsequent stage of this investigation. *pneumatic*, universe.

Twenty centuries! What an interval in the scientific history of a race that counts but forty and a half centuries, from the origin of political society, and from the commencement of learning? 190. Lord Bacon.

After so long and so profound a night, the human mind at length began to recover vigour; and intellect once more to exert its native energies. Original genius is the primitive fund on which learning must ever draw for its supplies; and, of original genius, none, than Lord Bacon, ever furnished more copious, and more splendid stores. He attacked and demolished established errors; he imparted to reason new forces, and new powers; and, for two centuries, he has given a direction to the scientific exertions of mankind.

Environed by enemies, men of this world, virulent, cunning; without the security derived from intrepid virtue; deceived, betrayed, by his king; the personal felicities of Lord Verulam were sacrificed to the good of the human race.

At the æra, when the precious talents of the viscount of St. Alban's were directed to the service of science, the intellectual energies of mankind had received a misdirection; of which it would be proper to impute all the blame to the ancients, if it were possible to remove the whole of the responsibility from the moderns. It con- 191. Effects a revolution in science.

sisted in the great error of substituting words for things. The greatest mysteries of nature were to be solved by mere logic; and the art of disputation was the summit of human genius, and attainment. Incredibly extravagant was the vanity of those modern logicians of Europe. To travel over the world, as a most learned doctor, alarming all monasteries, challenging all universities, disturbing all cities; disputing not in one art, or in one science, but in every thing; such was deemed the highest possible elevation of character. How inefficient and abortive this character, compared with those philanthropic and manly philosophers, of which Greece and Rome were so fertile; and of which an Ogilvie alone has afforded the example to America, and to modern times!

This haughty temper, this arrogant and presumptuous constitution of the mind; vain even of the frivolity of its acquisitions, and rendered proud by the very profundity of ignorance; Bacon sought, and successfully sought, to humble and to subdue. The proper modesty and humility of the mind were restored. A temperate distrust of its powers was substituted for a blind and temerarious confidence in its strength. The vaporous and cloud-built fabrics of mere word-choppers and logicians gave place to the solid foundations of inductive investigation; more humble, less airy, less aspiring, but durable, and secure.

192. Rapidity of its subse-

From this period the progress of science has been firm and certain. Nor has its march been slow. More has, since, been acquired, in a few

years; than, formerly, in a succession of centuries. It would seem as if now the intellect of man might indulge a virtuous and honourable pride, in its acquisitions and attainments. quent advances.

Such magnificent advances could not have been made in general science, without at least an attempt to methodize it; and a grand and happy attempt was made by Lord Verulam, which has commanded the admiration and approbation of succeeding times.

Lord Verulam does not appear to have noticed, or discussed, if he possessed, any preceding systems of distribution. The divisions of Pythagoras and Aristotle had either escaped his observation; or, what is more probable, were regarded by him as too frivolous and inadequate to merit any consideration. Certain it is that his own system, stamped with the qualities of his native genius, is original and *unique*. Alike indifferent of aid, and indignant of trammels, his firm and daring mind, depending only on itself, was determined to *find the road to truth, or to construct it.*

193. The system of Lord Bacon.

Regarding the soul of man as the seat of learning, Lord Bacon refers all the knowledge, which the human race are capable of attaining, to the respective faculties of the mind, employed in the acquisition of it. All ideas he believes to be derived from sensation, or from reflection. The faculties of the mind employed upon them, are the *memory*, the *imagination*, and the *reasoning power*.

Into these three great provinces he makes the partition of all the subjects of human knowledge.

194. Nomenclature commenced.

Without the aid of a nomenclature even this primary step could not be passed; and a nomenclature is therefore constructed.

This was, perhaps, the earliest direct attempt at scientific and comprehensive nomenclature. The paradisiacal operation of the progenitor of mankind afforded rather the elements of language; and Apollonius of Perga extended not his enterprize beyond three mathematical figures. No Linnæus, no Lavoisier, had yet trodden in that brilliant path of intellectual glory; and displayed the mighty energy of genius, amidst the abundance, and the opulence of imagination, exercising a chaste and an unerring judgment. Intrepid exertion and successful accomplishment; prostrating the imbecility of thought, and the timidity of indolence, and triumphing over the obstinacy of opposition, and the malevolence of hostility; had not, yet, demonstrated what unexpected results may be effected, by the perseverance of industry, the ardour of well-directed ambition, and the courage of undaunted resolution. It would not, therefore, be surprizing if, in nomenclature, error or imperfection should characterize the primary efforts; nor was it to be expected, in that age, that Lord Verulam, without a precursor, and without a beacon; without a pilot, and without a rudder; should have dared to embark on the wide ocean of *onomatopæism.*

To that great department of the knowledge of man to which the memory is the handmaid, Baron Verulam assigns the name of *History*. To so much of it as embraces the sphere of human action he had the authority of all the Greek writers for the application of the term; and for the remainder, comprizing in its grasp a great proportion of the material universe, a Roman example was not wanting. 195. History.

The province of history is distributed into natural and civil. Natural history, according to Lord Bacon, includes the ordinary productions of nature, monstrous productions, and the mechanical arts. What would constitute the modern sciences of astronomy, meteorology, geölogy, chemistry, mineralogy, botany, and zoölogy, would be comprehended under the first of these subdivisions; though it would also almost appear that, as sciences, they were at that day, with the exception of astronomy, entirely destitute of names, and that these even the ingenious viscount of St. Alban's does not venture to supply. Not only are names wanting, but the boundaries are not defined with precision; and natural philosophy scarcely appears. Some mistakes exist also, owing to the imperfection of science at that period. Comets are regarded as atmospheric phænomena, as much as wind and rain; and the history of pretergenerations, or monsters, as a distinct department, is perplexing without being useful. Agriculture is one of the mechanical arts.

Civil history, as contradistinguished from na-

tural history, comprehends ecclesiastical history, civil history proper, and literary history. It is unnecessary to pursue these subjects into their subdivisions; and it may merely be remarked that the latter term, literary history, includes a great portion of what, in the present times, are termed the belles-lettres.

196. Incongruity of the subjects contained in it.

It will soon be perceived what a mass of incongruous subjects is here brought together, in consequence of the accidental acceptation of a single word. The sun, the moon, wind, rain, fire, water, metals, plants, animals, the cultivation of the earth, manufactures, prophecies, providence, the tenets of Luther, of Calvin, the conspiracy of Cataline, the discovery of America; subjects, as widely separated in the nature of things as it is possible for the imagination to conceive, are collected under the general name of history, because the memory is supposed to be exercised in relation to them. The term history was never used, in such a sense, before it was thus applied by Lord Bacon; it has never come into use, in this sense, since his time; and it may, confidently, be asserted that it will never come into use, in this sense. The association is loose, and unphilosophical; and cannot withstand the test of a close investigation.

197. Poesy.

Feigned history, in the system of Sir Francis Bacon, is the basis of the second division. He applies to it the name of *Poesy*. This term must not be associated with the idea of verse. A true history may be in verse, and is not poesy. A

feigned history may be in prose, and is poesy. Verse itself belongs to the succeeding department. Satires, elegies, epigrams, odes, and other similar compositions, are referred to philosophy, and the arts of speech. Forged histories, counterfeited chronicles, and fictitious biographies, are, on the contrary, parts of poesy.

Notwithstanding this extremely devious, and almost absurd adjustment of the boundaries of the department of poesy, the subdivision of it is very elegant. Lord Verulam divides poesy into the epic, the dramatic, and the allegorical.

198. Philosophy.

History treads upon the earth, and poesy is only the dream of knowledge. The functions of reason are more elevated; and to them are appropriated the designations of philosophy, and of the sciences.

Philosophy, by Bacon, is divided according to its objects. Here he attains the true principle on which human knowledge ought to be divided. It is much to be regretted that he did not commence on this principle; instead of assuming that of the faculties of the mind, employed on the objects.

The principle, on which this great department is to be divided, being in itself correct, the subdivision is very beautiful and happy. The great objects of philosophy are three; *God*, *nature*, and *man*.

199. Primitive philosophy embarrassing.

He is much embarrassed by primitive philosophy, which is to precede these subdivisions. It is not in my power to convey a clear idea of what he here intends. It is one universal science, the mother of the rest; and of which they are only parts. It handles only the summits of things. It is a receptacle of axioms, which are not parts of any special science; but rather common to all sciences, or to most of them. It is not logic, nor natural theology, nor natural philosophy, nor metaphysics. It treats of the accessory conditions of entities, which may be called transcendants; as multitude, paucity, similitude, diversity, possibility and impossibility, entity and nonentity. It determines the reasons why some things in nature are so numerous, and so large; and why other things are so few, and so small; why gold is less abundant than iron, and why grass is more plentiful than are roses. It discovers the causes, why, between putrefaction and vegetation, there is the intermediate object of moss; between animals and plants, the oyster; between worms and the higher animals, rats and mice; between birds and quadrupeds, the flittermouse or bat; between birds and ordinary fishes, the flying-fish; between quadrupeds and fishes, the seal; why iron is attracted by the magnet, and not by other iron; why gold has an affinity to mercury, and not to other gold. This primitive philosophy contains a substantial and solid inquiry into these transcendants, or adventitious conditions of entities. The whole subject is utterly incomprehensible by me, and I presume will be found so by others. It is probably the evidence of a mind, great in itself, be-

wildered among the frivolities surrounding it; and which had been raised into disproportionate and transitory importance.

200. The same subjects in two different provinces.

There is a fault in the subdivision of the second branch, that of nature, which arises out of the erroneous principle on which the general system is constructed; that of partitioning knowledge into its provinces according to the intellectual faculties. All the subjects which appear in the first province, as the component parts of natural history, appear again, and in the same order, in the third province, as component parts of natural philosophy. What is the distinction between them, as parts of the first province, or of the third; as parts of history, or of philosophy? The distinction consists merely in this. Natural history inquires into, and reports, the fact itself; physics, the causes likewise. It will be soon obvious that this wide separation of the same subjects, and in the same succession, in reference only to this distinction, is multiplying sciences without any useful effects. Every subject is partially treated. In a distribution of knowledge, according to the objects with which it is concerned, the subject when fully met, should be fully disposed of. Light or electricity should not be the subjects each of two sciences; one referring it to memory, and the other to reason. This duplication of sciences, this recurrence of the same set of sciences in two different branches, would be an essential defect in any system. This fault is unavoidable in Lord Bacon's system. There are, in fact, two distinct and incompatible principles of division, operating

at the same time, one referring to the faculties of the mind, and the other to extrinsic objects; and incongruity must be the inevitable result.

201. Vague import of the term philosophy.

The term philosophy is, and has always been, one of the most vague and indefinite employed in language. Lord Bacon lays it down as a rule, in his progression, to invent no new terms; but to use, in all instances, existing words. The import of these however he would generally wish to change. Success has not followed him in these changes; and poetry, metaphysics, and magic, still remain terms in language, but none of them are used to express the ideas which Lord Bacon would wish to attach to them. Hence arises new confusion; and the science of metaphysics, as intended by Lord Bacon, can never be intelligibly expressed in modern language by that term. Without an attention to this circumstance, it would be impossible to comprehend the arrangement, which Lord Bacon makes, of the sciences, which grow out of his second branch; that of nature. With an exact comprehension of the division of natural philosophy, as made by Lord Bacon, will afterwards be better apprehended the alterations and improvements introduced into that department by D'Alembert, of France; and by the late President of the United States of America.

202. Natural philosophy divided by Lord Bacon in

Lord Bacon divides natural philosophy into theoretic and practical. Theoretic natural philosophy he subdivides into physics and metaphysics. Physics comprehend three sciences; none of which, however, have names. The first would

relate to the elements of bodies, the second to the general construction of the material universe, and the third to particular bodies. The latter is either concrete or abstract; the first relating to substances themselves, the second to their qualities. Here Lord Bacon exhibits great presumption, on the one hand, by asserting that he can demonstrate the opinion of the diurnal motion of the earth to be most false; and great weakness, on the other, by his credence in astrology. Metaphysics, for he uses the term here in an entirely new sense, the second part of theoretic or speculative natural philosophy, regards forms and final causes, and is a subject still more inexplicable than his former department of primitive philosophy. Practical, or operative, natural philosophy comprehends mechanics, and magic; the first produced from physics, the second from metaphysics. This magic he defines to be a science which, from occult forms, deduces wonderful operations; and by joining actives with passives discloses the secrets of nature. To complete this confused and unintelligible mass, mathematics are now introduced, and are made a part of metaphysics. They are divided into pure mathematics, and mixed mathematics; the former including arithmetic, and geömetry; the latter perspective, music, astronomy, geögraphy, architecture, and engineering.

a confused manner.

Thus, though the general division of Bacon, of the objects of philosophy into Deity, nature, and man, is so happy; yet, in deducing the sci-

ences appertaining to the great branch of nature, the most strange and perplexed medley is produced.

203. Human philosophy also.

Equally chaotic will be found Lord Verulam's subdivision of the third great branch, man.

204. General inference.

It may, therefore, be inferred, that the operations of Lord Bacon, in relation to the arrangement of human knowledge, and to the classification of the sciences, have been attended with little other practical result than the correct and elegant developement of philosophy into its three general ramifications. Accordingly, repeated exertions have been since made, on the one hand, to improve Lord Bacon's system, by deducing from the several provinces more apposite subdivisions; and on the other to devise a system founded entirely on different principles. It is unnecessary to observe that in this honourable, and probably extremely useful exertion, so great a degree of success has not yet, in any instance, been attained, as to produce a system generally satisfactory to the scientific world.

205. The radical principle of Lord Bacon's system erroneous.

The radical principle of the partition, in the system of Lord Bacon, is erroneous. Human knowledge can, by no means, be referred to the faculties of the mind, employed in the acquisition of it. The possession and exercise of all the faculties of the mind are requisite with respect to all knowledge. Nor is Lord Bacon's enumeration of those faculties by any means complete.

As little may the various subjects of knowledge be referred to the particular faculties that may be supposed to predominate, when applied to them. Even subjects apparently the most dry, and abstracted, require the exercise of all the faculties. Memory, imagination, and judgment, are employed in arithmetic; and are employed in poetry. Natural and civil history, which are referred to memory, require as much judgment; as language and belles-lettres, which are referred to judgment, do of memory.

206. Illustrated from ordinary life.

The distribution of the subjects of human knowledge according to the mental faculty supposed to be employed, or to be principally employed, in relation to them, may perhaps be illustrated by comparisons drawn from ordinary life.

If, in ordinary life, a person possessed of a large estate should be disposed to make an inventory of it, and should be imagined to have derived his resources from three distinct funds, each producing him an equal annual revenue; in determining to arrange the objects not according to any natural affinities, placing implements of agriculture together, and articles of household furniture together, but according to the fund out of which they might happen to have been purchased; the effect would resemble the operation of Lord Bacon's principle. Objects, allied in nature, would be widely separated by art; and objects, widely separated by nature, would, by art, be brought into contact. A plough and a cravat would be associated, merely because they may

happen to have been acquired from the same fund; a horse and a musical instrument would be found together; here a portion of the library joined to a part of the live-stock; and there a chirurgical, or a philosophical, apparatus blended with the last crops from the farm, or a cargo of goods on the ocean.

In like manner, would an inextricable confusion and perplexity characterize the enumeration, if the principle, assumed for the arrangement of the objects, should be, that of the tools or instruments with which they might have been fabricated. Here a certain set of objects would appear together, because the *hammer* was determined to be the principal tool or instrument in the fabrication of them; and elsewhere, perhaps, objects of equal dissimilitude referred to the *chisel*, and to the *saw*. In science, as in business, nature peremptorily commands that her affinities shall not be disregarded.

207. A remark made by the reverend Dr. Green, of New-Jersey.

When I had the honour, at Princeton, of a personal interview with the president and professors of the college of New-Jersey, on the eighth day of February 1816; for the purpose of explaining the system, which this discussion is designed to develope; a remark was made, on the subject of nomenclature, by the reverend Dr. Ashbel Green, president of that institution, which may be applied with very great force to the system of Lord Bacon. It was observed, that *it is much easier, in practice, to introduce terms entirely new, than to change the meaning of terms already*

received in language. This judicious and sound remark is abundantly verified, on a reference to the facts, in relation to the nomenclature of Lord Bacon. The invention of new terms is disapproved by him; and Aristotle is directly censured on that account. The liberty of changing the meaning of received terms is, on the contrary, claimed; and exercised in the fullest latitude. As instances, the five terms of philosophy, history, poetry, metaphysics, and magic, may be given. These terms continue to be used at this day, in the same senses that they were used before the time of Lord Bacon; and no one of them has been received into language in the sense which Lord Bacon would attach to it. Philosophy includes all science, as much as it before did; and not one particular province. Natural history, and civil history, have never yet been brought together, as parts of one general science. They preserve, in every discussion, the separation and distance which nature and reason have assigned them. The Travels of Anacharsis are not, in modern parlance, poetry, which they would be by Lord Bacon's limitations of the meaning of the term; and the production of Lucretius, and the Botanic Garden of Dr. Darwin, are poetry, in modern parlance, though Lord Bacon would exclude them, and refer the one to philosophy, and the other to history. The term metaphysics is still applied to the mind, and not to the forms and final causes of physical objects; and the term magic still imports superstitious mysteries, and not a rational use of recondite natural principles. Every attempt to change the meaning of received terms has failed; and, on

the contrary, the judicious introduction of new terms has abundantly succeeded. Phlogiston, oxygen, hydrogen; the whole botanical and chemical nomenclature; attest the correctness of the position stated by the reverend Dr. Green; and prove that a system, formed on correct principles, must carry its nomenclature with it. The system of Lord Bacon was never received on the continent of Europe, until the time of D'Alembert; and, neither in Great Britain itself, nor on the continent of Europe, has the nomenclature been adopted.

208. Des Cartes.

So great a blaze of intellectual glory as, in consequence of the honourable and manly exertions of Lord Bacon, encompassed Great Britain, could not, however, long distinguish that country, without exciting the emulation of the rival genius of France; and Des Cartes treads, with a rapid step, in the splendid career of the learned viscount of St. Alban's.

Of military characters, few than Des Cartes have attained greater celebrity, in the annals of science. At his day too, science began to be valued, and to be honoured in the external world. He received himself tributes of high respect. His sovereign, the king of France, settled upon him an annual revenue; and the queen of Sweden formally invited him into her dominions, adding to a pecuniary income a real estate. After his decease, in that country, his remains were required by, and conceded to France; and a magnificent interment manifested how much he was an object

of national regard. Since the superior merit of Sir Isaac Newton, that of Des Cartes has not been sufficiently appreciated. To Boccacio belongs the honour of having been the earliest to use vernacular language, in elegant prose composition; but in the application of vernacular language to science the first was Des Cartes.

209. His system.

The Cartesian system of philosophy is extremely neat and perspicuous in its divisions. Anterior to the consideration of the things, with which the human mind is conversant; it requires a recognition of those principles of reasoning by which its investigations must be regulated. Associated with these, mathematical truths are ingeniously considered. Metaphysics, embracing theology, and the philosophy of the human mind, immediately succeed. Then follow physics; including astronomy, and the knowledge of the earth, the air, water, fire, the magnet, light, minerals, plants, animals, and especially man, medicine, ethics, and the mathematical arts. The ambition of the author would have presented to mankind an entire body of philosophy, in a method of more than ordinary clearness; if, on the one hand, the materials of knowledge had in his age been more abundant, and, on the other, the love of it more expanded. His enterprize is necessarily limited; but in every step which he advances, in the execution of it, clearness, precision, and sound judgment, designate his progress.

210. Mr. Hobbes.

In this literary belligerence blow is given for blow; and Mr. Hobbes, of England, quickly follows the philosopher of France.

Mr. Hobbes divides human knowledge into two great departments; the knowledge of fact, and that of consequences. Sensation and reminiscence are the sources of the first; and they constitute absolute knowledge. Reasoning defines the latter, and the knowledge is conditional. If these be the premises, and these the data; such is the conclusion, and such are the results. To the knowledge of facts when registered, he appropriates, in the same manner as Lord Bacon, the denomination of history. All facts which are independent of human volition compose natural history. Civil history comprehends those which are connected with the volition of man. To the consequences resulting from affirmations he assigns the appellation of science; which is regarded as synonymous with philosophy. The dominion of science is elucidated by a tabular representation.

Science, or philosophy, is either natural philosophy, or civil philosophy. Natural philosophy commences with that primary philosophy which regards, in the abstract, quantity, and the laws of motion. Mathematics, including geömetry and arithmetic; cosmography, including astronomy, and geögraphy; and mechanics, including engineering, architecture, and navigation; compose the remainder of the science, so far as relates to quantity and motion determined. He assumes the office of the nomenclator, and introduces the new science of *sciography;* while it would appear that the terms aërology, mineralogy, and botany, had, in his day, not yet found admission into language; and as well with respect to them, as with respect to a

science which he would found on the senses of touch, taste, and smell, he is not so adventurous as to attempt a name. He treats astrology with respect. Optics and music would almost form a part of what is the modern zoölogy. On the basis of the passions of man he erects the science of ethics. Four important sciences result from speech; poetry, rhetoric, logic, and jurisprudence.

In the system of Mr. Hobbes there appears to be nothing gained. Compared with that of Lord Bacon it is meagre; and contrasted with that of Des Cartes it is marked by an obvious inferiority of method. Combinations peculiarly absurd characterize its concluding arrangements.

211. The Sieur de Lesclache.

In the very year immediately succeeding the publication of the system of Mr. Hobbes, at London, appeared, at Paris, that of the Sieur de Lesclache.

The work of the Sieur de Lesclache presents a very rare and singular object. It is a quarto volume, composed entirely of engravings, without any letter press. In these is exhibited an abridgment of philosophy in tables; or, in other words, a systematic developement of all human knowledge, addressed at the same time to the understanding, and to the eye. It would only be necessary that the analysis should be correct, and the nomenclature compendious, to render a task of this description as useful in practice, as in the design it is ingenious.

A comprehensive definition is given of philosophy. It is "a very certain and a very evident knowledge of human and divine things, which men may acquire by their understanding."

It is divided into contemplative and practical. Contemplative philosophy regards three several departments; first, corporeal things; secondly, spiritual beings; and thirdly, things which are common to corporeal things and to spiritual beings. To these departments are respectively appropriated the names of physics; for the French word will not bear a singular translation in the English language; natural theology, and general science. Practical philosophy is beautifully subdivided. It conducts the action first of the understanding, and then receives the appellation of logic; and secondly of the will, when it is denominated morals.

In prosecuting the subject the Sieur de Lesclache selects these five departments as comprehending the whole range of human knowledge and acquirement; and marshals them in a rank distinct from that deduced by the analysis, of which though the reasons are not given, the results are evidently advantageous.

All human knowledge, according to the Sieur de Lesclache, would then be arranged under the following five great sciences; logic, general science, physics, morals, and natural theology. His system appears to be perfectly disembarrassed of the term metaphysics. Under the second denomi-

nation, however, of general science; both from the table of philosophy at large, and from the three particular tables which elucidate the subjects comprehended under the term of general science; much of what would now be deemed metaphysical disquisition is contained.

212. Comenius.

The flames of war, once enkindled, are apt to involve others than the original parties; and while England and France have hitherto been the exclusive combatants, the brave Comenius, of Moravia, now interposes to represent the dignity of the Germanic empire.

Comenius, born in 1592, and ordained a pastor at the age of twenty-four, belonged to the intrepid phalanx of the protestants; and religious persecution, ever the foe of learning, drove him from his native country. Poland, Sweden, England, offered him an asylum. His personal preference directed him to the latter country; but political ferments, always engrossing for the time being, the exclusive attention of the human mind, and England just entering into the infelicitous state of civil warfare, he left it, in the year 1641, for Sweden. His reception was honourable, but subsequent considerations induced his removal to Amsterdam; where, in 1671, he closed a long, an active, and a useful, life.

Comenius is the author of a production more singular, and more ingenious, than that of the Sieur de Lesclache. It is a work composed of one thousand sentences, divided into one hundred

chapters; in the composition of which, he has contrived to introduce almost every word used in any ordinary language. By contrasting these sentences, in any one language, which is known, or which has been acquired; against the same in every other language, which is desired to be known; a very commodious and efficient method is presented for the acquisition of all languages. I have seen these sentences in six languages; the Latin, the Greek, the English, the German, the French, and the Italian. A more happy or expeditious method of imparting a knowledge of them could not be devised. But he has not confined himself to the mere task of constructing unconnected sentences, containing the words of ordinary language. He has so combined them as to constitute a complete body of knowledge; succinct indeed with respect to its compass, but competent to evolve all its parts, in a handsome analysis. This ingenious and elaborate production bears the title of "the golden gate of languages unlocked."

Comenius sets out with a proposition which would, perhaps, startle the modern cultivators of science. He has laid the foundation of all erudition, who has perfectly acquired the nomenclature of the objects of nature, and of art. To know in what consists the differences of things, and to be able to designate those differences by proper appellations, is the essence of human learning. Words are the signs of things; and he, who properly understands the words, must understand the things which they signify. Both

ought to be taught together. It is absurd to separate them. There is no difficulty in the acquisition of the knowledge of both, if the concinnous order of nature be observed.

The principle of the first division is extremely exact. All things are comprehended under the general heads of *nature*, *man*, and *God*. Philosophy is the investigation of the causes of things. It comprehends five great branches; metaphysics, physics, mathematics, ethics, and philology.

213. Le Grand.

The first edition of Comenius appeared in Poland, in the year 1631, and in 1638 and 1643, impressions were made in Holland, but having himself prepared the work for the English press in 1659, it was not actually executed until 1685; only two years previous to the grand operations, in science, of Sir Isaac Newton, and Mr. Locke. In the mean time the Cartesian philosophy was renovated and enlarged by Le Grand; and a notice of the improvements made by him will complete all that is necessary to be observed, with respect to the divisions of human knowledge, anterior to Mr. Locke.

The work of Le Grand, appeared at Nuremberg, in the year 1679. All human knowledge is by him distributed into three great provinces; metaphysics, physics, and morals. These are subdivided into ten several departments, or principal sciences. Logic is the first of these; and is immediately followed by theology, and the subject of the spiritual world. General physics constitute

the fourth branch; the material world and the heavens are the subjects of the fifth; and the four elements of the next. Animated nature, in general, inclusive of plants, forms one great science; but man is separated from it, and what concerns him, regarded as an animal, is erected into a distinct science. The human mind and morals occupy the two last departments. Thus the Cartesian philosophy, in itself luminous and distinct, in relation to its divisions, was brought to the summit of its perfection, by the labours of Le Grand; just before it was about to be extinguished and lost in the splendor of the Newtonian.

214. Mr. Locke.

The celebrated disquisition of Mr. Locke, on the intellect of man, was completed for the press in the year 1687; and, in that same year, appeared the mathematical principles of natural philosophy, by Sir Isaac Newton. These two works have changed the destinies of the human race. They have effected a revolution, of which the force will not be spent, while man remains upon this earth. The names of Locke and of Newton will for ever be coëxistent with science. They reflect immortal honour on the English nation. To her, and to them, a debt of gratitude is due, which can never be paid.

Seldom has been exhibited, in the history of the human mind, a course of thinking so profound, so patient, so candid, as that of Locke. How great is his assiduity, how distinguished is his perseverance? Is it credible that such a man

was exposed to inconveniences and persecutions from the insolence of a servile courtier, and the baseness of an unprincipled king?

Philosophers have rendered great injury to the cause of Christianity, and particularly those of France. Newton and Locke are, however, distinguished as two philosophers, who have rendered it the most essential services. The latter days of both were devoted to its interests. Newton published observations on the prophecies of Daniel, and on the apocalypse of St. John. He endeavours to prove that the famous prophecy of Daniel's weeks was an express prediction of the Messiah; and was fulfilled in the institution of Christianity. Locke wrote a treatise on the reasonableness of Christianity, and a paraphrase and notes on the epistles of St. Paul. The productions of these two celebrated and profound philosophers, both laymen, have not only rendered more service to the cause of Christianity than the writings of all other philosophers have been able to do it harm; but they have even been more serviceable than the whole mass of theological controversialists.

215. His chapter on the division of the sciences.

The labours of Mr. Locke, in his essay on the human understanding, were crowned by an attempt to divide the sciences. The last chapter of that discussion is on this express subject. It is a very short chapter, not occupying much more than a page; and though the ultimate discussion of a very long and elaborate work, might appear as

the commencement of a task of equally protracted and difficult accomplishment. Mr. Locke does not appear, during his subsequent life, to have added any thing, on this subject, to what is contained in that chapter; nor ever to have undertaken to carry out, and reduce to practice, his own division.

216. The origin of the present enterprize.

It was the perusal of that chapter, in the year 1788, or at some period not long anterior to it, which gave origin to the present enterprize. The system which it is the object of this discussion to develope was completed in the year 1795; and was begun to be divulged in the year 1813. It now asks the investigation of the cultivators of science in the western hemisphere. We have received much from the other hemisphere, and we owe something in return. In the cause of science even the attempt to be useful is laudable; and if the classification of the sciences has not been effected, it is the duty of my fellow citizens, by supporting and following up the attempt, to secure that yet ungathered laurel for the Columbian republic.

217. The system of Mr. Locke.

The system of Lord Verulam was, unquestionably, before the eye of Mr. Locke; and as he takes no notice of it, and commences a division of human knowledge, on original principles, possessing no resemblance to the former, it must be presumed that, on due examination, the mind of Mr. Locke became fully satisfied of its imperfection, and inadequacy.

Mr. Locke divides all that can fall within the compass of the human understanding into three great provinces. 218. Three provinces.

The first comprehends things as they exist in themselves; the nature of all beings, material and spiritual; their constitutions, their properties, their relations, and operations. To designate this province, he would appropriate the term *physica*. He would use this term in a sense a little more enlarged than customary; so as to include not merely the objects of the material universe, but those of the spiritual also. It would be synonymous with the term natural philosophy. Its object is bare speculative truth. Theology, spiritual beings, the human mind, natural bodies, all their respective affections, among them arithmetic and geömetry; in short, whatever can afford the mind of man any speculative truth; fall under this branch. 219. Physica.

The second province is established on the basis of human action. What man, regarded as a being possessed of reason, and of volition, ought to do for the attainment of any end, and especially happiness, would be here comprized. It is the skilful and correct application of his powers to the attainment of good and useful objects. It is the investigation of those rules of human actions, and those estimates of them, which conduct to happiness; and of the means of reducing them to practice. Its object is not bare speculation, not the mere knowledge of truth, but a complete 220. Practica.

knowledge of rectitude in action; and a conduct in perfect conformity to that knowledge. To this province Mr. Locke would appropriate the name of *practica;* of which ethics constitute the most considerable department.

221. Semiotica. The instruments and the means by which both physical and practical knowledge are attained, and are communicated, compose the third province. It considers the nature of the signs, of which the mind makes use; either in understanding things, or in imparting its knowledge. Of these the most usual are words. They are the representatives of ideas. With the exception of the mind itself, no subject is actually present to its contemplation. Ideas are the representatives of things. The ideas in one human mind cannot immediately be exposed to the view of another. Fleeting in their own nature, the mind cannot, without the intervention of some instrument, treasure its own ideas. Signs become necessary for the communication of our ideas to the minds of others, as well as to record them for our own use. The most convenient signs are articulate sounds, and ideas and words are the great instruments of knowledge. As such, they are no despicable subject of contemplation, in taking a view of the whole extent of human knowledge. To this province Mr. Locke would appropriate the name of *semiotica.* This term is devised by him, from the Greek word, σημειον; signum, a sign. As words are the principal signs it might also, with sufficient aptitude, receive the denomination of *logica.*

Such are the three great provinces of the intellectual world. They are entirely different from one another; wholly separate, and distinct. 222. Remarks on the system.

It is a great beauty in the system of Mr. Locke that the sciences are divided according to the nature of the subjects; and not according to the faculties of the mind, employed, or supposed to be employed, on them. It is, therefore, much to be regretted that he did not pursue his own division; and exhibit a complete subdivision, and developement of the sciences. That of the first province or branch alone would have been highly interesting.

Popular language has not yielded to the wishes of Mr. Locke in enlarging the import of the term *physics;* so as to include under it the divine and the human mind. Equally unbending has it proved to those of Dr. Campbell; who, in his philosophy of rhetoric, earnestly solicits the same favour for the term *physiology*.

The propriety of comprehending in the same province or department both material and spiritual being will hereafter be investigated. It may in the mean time be remarked that it has the decided approbation not only of Dr. Campbell; but of Dr. Adam Smith, and of Professor Stewart, of Edinburgh.

It is observed with respect to the second province, denominated practica, that its most considerable branch is ethics. It is however difficult

to determine, the author having left no aid, when the ethics are taken out of this province, what composes the remainder of it. Are the mechanical, or the fine arts, parts of practica? Is religion a part of this province? Are medicine, agriculture, history?

In like manner in the third province, which is occupied with the doctrine or learning of signs, it is observed that words are the most usual signs. Are, or are not, any other signs intended to be included in this province? Would algebra be here? Would heraldry?

If language alone occupies the third province a change is desired of the meaning of the term logic. Mr. Locke seems to be embarrassed by the want of a plural to that word in the English language. In this instance he translates, what from its evident analogy with the two preceding terms is intended to be a Greek plural, by an English singular. He includes in the province much more than appertains to logic, and it is doubtful whether logic is really a part of this province; and, if admitted, how much more ought to follow. Are rhetoric and poetry to be sought for here? Is it intended that history should appear here? It will be perceived that the word, *criticism*, had not been introduced into the English language when Mr. Locke wrote; and that, from the strict analogy between the terms *logique*, and *critique*, in French, he is deceived into an improper use of the word *critic;* it never having been adopted in the English language in one of the senses which it bears

in the French. The wonderful results which he would seem to anticipate from the introduction of a new species of logic and criticism, which the world had not before been acquainted with, would terminate in nothing else than greater precision in the use of words; a tendency which every language assumes, in proportion as it is more and more cultivated.

223. Leibnitz. It might have been expected, from the active and excursive investigations of Leibnitz, that some general classification of human knowledge would have been attempted by him. I am not, however, able to present any thing which would be in the least degree satisfactory.

224. Wolfius. His disciple Wolfius met with the illiberal persecution of the clergy of Saxony; in consequence of bestowing some encomiums on the moral philosophy of the Chinese. He produced a work, under the title of "Universal Practical Philosophy, written in a Mathematical Method." Whatever indications the title may offer I have not been able to meet with it.

225. Croker. I am also deprived of the opportunity of now examining a system of human knowledge, by an English writer, of the name of Croker, author of a scientific dictionary.

226. Chambers. The scientific dictionary of Mr. Chambers, which appeared in England in the year 1728, absorbs all interest in the bibliography of other previous works, of the same description. This is

remarkable, not only for a new, and original division of human knowledge; but as having laid the foundation of the great French encyclopædia. It was one of the most popular works which was ever published, and perhaps became so from its author's assuming no pretensions to the character of a philosopher; contented with a sphere of humble and industrious usefulness. It is this work which is the foundation of Dr. Rees's Cyclopædia, which is now supplying the people of the United States of America, from the Missouri to the Atlantic, and from Georgia to Maine, with the exquisite treasures of European science; diffusing over the new hemisphere all the literary opulence of the old.

227. Merits of Mr. Chambers.

Mr. Chambers deserves great credit for having revived, with equal spirit in the attempt, and utility in the result, the ancient Greek terms, *cyclopædia*, and *encyclopædia*. No terms could more definitely express the object intended, and none are clothed with greater elegance. He appears, however, to have gone much farther than any of his predecessors; and even than any of the most renowned philosophers. He is not satisfied with a most elaborate exposition of all human knowledge in detail, and as its parts are presented in alphabetical succession; but he endeavours to reduce the whole of it into *one science*. He is the first who has attempted, what may be termed, *a catholepistemia; a system of universal science.*

Lord Bacon had made but very little progress towards effecting such a result. Not a single spe-

cific science appears in any of his three provinces of history, poetry, and philosophy. Equally remote is Mr. Locke from any succession of specific sciences, susceptible of enumeration, and of concatenation; and exhibiting, as a portion of some one of them, every possible subject of human knowledge.

Whatever may be thought of the concatenation of the sciences made by Mr. Chambers; whoever will examine his enumeration of forty-seven specific sciences, under the appellations which he has attached to them, will find that they embrace almost the whole of human knowledge. In this instance he has the honour also of laying the foundation for the second great French encyclopædia, *l'encyclopédie méthodique.*

228. Fortunate in specific nomenclature.

If the attention can be invited one step farther, and induced to bestow a critical examination on the nomenclature of Mr. Chambers, it will be found that there is not a single name that he has attached to the forty-seven sciences which he has established, but is still retained in language; and, for the most part, in the very same senses in which he has made use of them. This is a strong evidence of his judgment; and he is, in this respect, much more fortunate than either Lord Verulam, or Mr. Locke. An alphabetical reduction of his forty-seven names, and a contrast of them with those of the methodic encyclopædia, and even with the majuscular terms of the Encyclopædia Britannica; will elucidate his merit. There are only two of them which do

not at this day appear, either as sciences, or as arts; either in treatises, or in ordinary discourse. These are analytics, and hydrology, of which the first was, in a great measure, superfluous; and modern science has not yet attained the perfection, which Mr. Chambers would have imparted to it, if the second had been admitted.

229. Not so in divisions.

While Mr. Chambers is thus, singularly, judicious and fortunate, in relation to nomenclature; he is glaringly defective on the side of arrangement. In this respect, he seems to have been followed by none. D'Alembert immediately abandons him, and returns to Lord Bacon. Nor will his system, in this particular, stand the test of investigation. It opens with meteorology, and concludes with poetry. Some sciences stand in the double relation of genus and species. Arithmetic is itself a specific science. At the same time it includes two other specific sciences; analytics, and algebra. The same observation may be made respecting ethics, optics, mechanics, pyrotechnia, astronomy, and geögraphy. Commerce is not a part of geögraphy; and the military art, and fortification, appear, with extreme oddity, as departments of *pyrotechnia*, or artificial fire-works. In short, the whole of the generic nomenclature is as absurd and infelicitous, as the specific is judicious and happy.

230. His system.

The system of Mr. Chambers, with these preliminary remarks, will be easy to explain. He divides all knowledge into natural and artificial. Natural is either sensible, or rational; and arti-

ficial either internal, or external. Natural history is sensible natural knowledge. Physics, metaphysics, mathematics, religion; compose rational natural knowledge. Logic is internal artificial knowledge. External artificial knowledge is divisible into real and symbolical. Real external artificial knowledge embraces, chemistry, mixed mathematics, and medical and agricultural information. Symbolical external artificial knowledge comprehends, grammar, heraldry, rhetoric, and poetry. This is the whole system. It has no history, nor biography, nor antiquities.

231. The generic nomenclature unintelligible.

This uncouth and unintelligible generic nomenclature arises entirely from the attempt to use received English words in senses which they will not bear. The distinctions of the author are in themselves perfectly intelligible; but the words by which he expresses those distinctions are not so. The terms do not express what the author intends that they should express; and, at the same time, they do express what the author intends that they should not express. They involve contrasts which are immediately perceived to be incongruous. We are unable to recognize unnatural knowledge, or insensible, or irrational knowledge, or unreal arts; which are all implied by their respective positives, natural, sensible, rational, and real. At the same time there would be no difficulty in referring certain arts to the mind, and certain other arts to material objects; and not a great deal more in separating natural history from natural philosophy. Here is complete proof of an observation, afterwards made by Dr. Wil-

lich; that *without a new nomenclature the exact classification of science is an impossibility*. The distinctions of Mr. Chambers, in English words, are not only uncouth, but unintelligible; and new terms, judiciously constructed, might have made those distinctions, if solid and proper, not only perfectly intelligible, but even graceful and harmonious in the expression. The propriety of the distinctions will be hereafter adverted to. His terms for universal knowledge, thus presented in detail, in the alphabetical succession of the words which relate to it, are perfectly unexceptionable; and will command lasting approbation. The terms *cyclopædia*, and *encyclopædia*, are by no means liable to the cavil which he takes the pains to refute; that they might import *the knowledge of the circle*, as much as *the circle of knowledge*. The analogy of the language determines them to the latter signification, and excludes the former.

232. Baumeister.

Anterior to the appearance, at Paris, of the grand French encyclopædia, by Diderot and D'Alembert, a division of human knowledge, as presented in the philosophical system of Baumeister, was published in Holland; a production remarkable, like those of Batavian literature, in general, for the elegance of its latinity.

According to a fashion which had been prevalent, the necessary introduction to all human science is made to be, logic. History, philosophy, and mathematics, compose the remainder. History is merely the knowledge of facts; whether natural, or relative to man. Philosophy is divided into theore-

tic philosophy, and practical philosophy. Physics and metaphysics constitute theoretic philosophy. Metaphysics are composed of, ontology, cosmology, psychology, and theology. Universal practical philosophy, the law of nature, ethics, politics; are the four component parts of practical philosophy. The fate of the term metaphysics is singular. It is, sometimes, made to precede, and, in other instances, to follow physics; and, after having been placed in the front rank, by Des Cartes and Le Grand, is now restored to the rear, by Baumeister.

233. Martin.

Contemporary with Baumeister, on the continent, may be regarded Martin in Great Britain; though, in strict chronology, he is anterior in some respects, and later in others.

In his philosophical library of literary arts and sciences, in his philosophical grammar, in his general magazine of arts and sciences, are exhibited bold and persevering exertions to reduce human knowledge into system. He is remarkable for spirited attempts in nomenclature, and for a preference of Latin radices. His productions are so familiar, and accessible, in America, that it is sufficient to comprehend them in the enumeration of those who have made, or attempted, arrangements of human knowledge; without, at present, rendering them the subject of a particular criticism.

234. D'Alembert.

The great French encyclopædia is only an enlargement of the cyclopædia of Chambers. The

arrangement is the same; if that may be termed arrangement which is merely alphabetical succession of words, with dissertations attached to them, either less complete, or more extended. In the French encyclopædia the dissertations were more dilated. There were reasons for it. The readers were more numerous. Paris has a continental demand for its productions. That of London was merely insular and colonial. The dissertations on the words are much more elegant in the Britannic encyclopædia, and they are equally philosophical. In moral and religious disquisitions the superiority of the latter is incontestable. The French encyclopædia possesses, however, an enviable ornament in the preliminary discourse of D'Alembert.

235. His preliminary dissertation to the French encyclopædia.

The preliminary dissertation of the original French encyclopædia has been termed one of the most capital productions of which the philosophy of the present age can boast. It is a discussion, expressly, on the origin, the progress, and the affiliations of the sciences. If, therefore, Europe could have presented a correct systematization of the sciences, here it might have been expected to be found. So far from it, on the contrary, no original system is offered; that of Lord Bacon is revived; and the assertion is advanced, directly, and in express terms, that the task is of impossible execution.

It will be only necessary, therefore, to review the alterations of Lord Bacon's system, made by M. D'Alembert; and to examine how far those

alterations are, on the one hand, emendations and improvements; or, on the other, deteriorations.

236. Examination of it.

The encyclopædia of Messieurs Diderot and D'Alembert professes to have in view two objects. The first of these is, to exhibit the order and concatenation of human knowledge. The second is, to present an accurate dictionary of arts, of sciences, and of trades; and a rational exposition of their respective principles. It is pronounced difficult to comprize in a system, which shall be characterized by unity, the infinitely varied ramifications of human knowledge. It is notwithstanding beautifully deduced. It is divided into direct and reflected. The first is independent of volition. Our own existence is the first step in knowledge, and that of extrinsic objects the second. Direct knowledge appears to afford no basis for sciences. These depend entirely on the reflected. No order or concatenation of the sciences is, however, produced; and the first object proposed to be attained is, gradually, abandoned. Reasons, which are far from being satisfactory, or even plausible, are assigned for not discussing the sciences in distinct treatises. It was obviously impossible, until they were reduced into system, so that they might not only be distinct; but be at the same time so comprehensive as to include every subject of human knowledge, under some one of them. The failure of the main design sufficiently accounts for the inexecution of the parts.

237. Deteriorates Lord Bacon's system.

D'Alembert changes the order of the subjects. Bacon deduced the faculties in the order of, memory, imagination, and judgment; and the corresponding provinces of knowledge in the order of, history, poetry, and philosophy. D'Alembert arranges the faculties in the order of, memory, judgment, and imagination; and the departments of knowledge in that of, history, philosophy, and poetry. No satisfactory reason is assigned for the alteration. The order of Lord Bacon is unquestionably the natural order; and, in this respect, the original system is altered, but by no means improved.

The first province, that of history, is divided by Lord Bacon into natural and civil; by D'Alembert into sacred, civil, and natural. The preference would in this instance again attach to the original system. Ecclesiastical history is not, in its essence and nature, distinct from civil history. Lord Bacon's division of civil history, into sacred, civil proper, and literary, is much preferable to that of D'Alembert. The order of Lord Bacon; that of, natural history and civil history; is better than the order of D'Alembert; that of, sacred history, civil history, and natural history.

238. Improves it.

In the second province of D'Alembert, which is the third of Lord Bacon, an alteration is made in the arrangement of the subjects. The arrangement of Lord Bacon is, God, nature, man. That of D'Alembert is, God, man, nature. This is a real improvement. Either the succession of, nature, man, God, ascending from material to men-

tal objects, interposing the combination of both; or that of, God, man, nature, descending from the spiritual department to the material, the combined form equally intervening, would be correct; but the succession of Lord Bacon, God, nature, man, separating the subject of mind by the intervention of the material universe, appears to have no reason or propriety in its favour.

In like manner, in the subdivision of the third branch of D'Alembert, nature, the second of Lord Bacon, the superiority is evidently on the side of D'Alembert. The science of nature is elegantly and perspicuously distributed into, mathematics, and physics; and the order is correct, mathematics before physics, the knowledge of the instrument before that of the object on which it is to be subsequently employed. With the same propriety arithmetic is made to precede geömetry. If the subject of mathematics be pursued, on the system of D'Alembert, to its remotest ramifications, the same preference will attach to it. His subdivision of the pure mathematics is correct, analytic, and insusceptible of any improvement. Arithmetic proper precedes algebra, algebra precedes fluxions, and the elementary geömetry precedes the transcendant. The physicomathematics will be the subject of future remark. A variety of names likewise appear which are very useful. The terms, hydrostatics, hydraulics, dynamics, optics, pneumatics, acoustics, zoölogy, botany, mineralogy, chemistry; are now found in scientific language. The science of nature, as subdivided and arranged in the system

of Lord Bacon, is, on the contrary, an entire mass of confusion and disorder.

In the subdivision of the third branch of Lord Bacon, which is the second of D'Alembert, man; the perspicuity is greatest in the system of the latter. Both, however, will be found sufficiently defective; and the diversity of results is truly surprizing. Medicine, cosmetics; athletics, painting, and music; are deduced in this branch, by Lord Bacon. By D'Alembert, music and painting are made parts of poetry; and medicine, it is believed, belongs to history. Agriculture, in Lord Bacon, is a part of history; in D'Alembert, of philosophy. Architecture is a part of poetry, in D'Alembert; of philosophy, in Bacon.

239. Introduces a gross deformity.

The arrangement of painting, sculpture, music, architecture, and the fine arts in general, in the province of poetry; though so revolting to the mind, at the very first view; is, yet, a correct deduction from the principle of the division.

240. Increases the confusion of the sciences.

Viewed as a whole, the arrangement of D'Alembert, though it improves the clearness of some of the parts, still rather increases than diminishes the general confusion. There are many curious and useless repetitions. The frivolous matters are not expunged. The deduction of specific and individual sciences is much more remote than in the system of Mr. Chambers. On the contrary, matters appertaining to one subject are infinitely separated and diffused. Let the subject of the heavenly bodies be selected for an example. It

would be found under eight various heads; celestial history, celestial prodigies, geömetrical astronomy, uranography, physical astronomy, physical astrology, uranology, judicial astrology. The same may be observed of water, earth, and air. Though he transfers the fine arts to the province of poetry, he leaves epic poetry in the province of philosophy. In the improvements of the system of Lord Bacon, effected by Mr. Jefferson, all these aberrations of D'Alembert are reformed.

It is remarkable that while, in the text of the preliminary discourse, D'Alembert uniformly refers to an exposition of the system, in the form of a tree; yet, in the figured system annexed, it is presented only in the form of a table. Nor does Lord Bacon exhibit his system in the shape of a tree. A succession of representations in the shape of a tree, would impart a much more clear conception of the differences of the three systems of Lord Verulam, M. D'Alembert, and Mr. Jefferson, than can possibly be conveyed by words. It may, however, be observed that a difficulty would exist in the representation of the system of D'Alembert. It is not the same in the preliminary discourse and in the table. It would seem that they are, partly, executed by different hands. Perhaps M. Diderot, principally, prepared the latter.

241. Rollin.

Anterior to the very celebrated operations of D'Alembert, in the arrangement of the arts and sciences, might be regarded the productions of Rollin. No further observations, however, would

be necessary, with respect to these, than have already been made, in relation to the English philosopher Martin. It is time, however, to draw the attention to the other hemisphere.

242. Bishop Wilkins.

But, before leaving Europe, it may afford a satisfaction to advert to the enterprize of Bishop Wilkins, for introducing a real character, and a philosophical language.

243. His real character and philosophical language.

The Chinese cannot comprehend what is understood by a dead language. Two such languages having, however, existed in Europe, anterior to the æra of the nations which now occupy that quarter of the world; and those languages having been highly cultivated, one of them was made use of, during the infancy and imperfection of the vernacular languages, for scientific purposes. It appeared to be attended with great advantages, and the learned seemed to be in possession of a common language. It was not at first observed that a dead language, in actual use, must necessarily soon become a living language; nor was its inadequacy immediately perceived, nor the intrinsic superiority of some of the vernacular languages appreciated. A universal language was a desideratum in the literary world, at the period when the plan of the learned bishop of Chester was produced. The imperfections of the Latin language began to be apprehended; and the existence of a complete and polished hieroglyphical language, in China, had become known. Hence arose this ingenious and elaborate attempt. It will not be proper to bring it into investiga-

tion in relation to its direct objects; a character to express thoughts; and effability, if it may be so termed, again, philosophically, imparted to that character; whatever curiosity may attend the enterprize itself, or the execution of that enterprize. It comes into view, in this discussion, merely on account of the obligation, which the inventor came under, of arranging, in some degree, that mass of knowledge about which language, of any kind, is employed.

244. His system.

If the forty genera, into which Bishop Wilkins finds it convenient to distribute all the ideas, and all the words, which language would require, be assumed as so many specific sciences; which some of them well might, while others could not; the concatenation and arrangement of human knowledge would come out, nearly, in the following manner.

Human knowledge is either transcendental or predicamental. The first would comprehend, metaphysics, logic, and theology. The second would include, substance, and its four accidents, quantity, quality, action, and relation; which he makes to be the five categories. Under the first all natural history, and, perhaps, natural philosophy, would be contained. The category of quantity, would contain the mathematical sciences; and that of relation, most of those concerning human transactions. The two other categories, of quality and action, would be found to contain many words, and few sciences.

245. The American Dr. Johnson.

If we may now be permitted to traverse the Atlantic, we shall find that, at the very same time that D'Alembert was, in France, engaged in devising improvements on the system of Lord Bacon; an attempt was making, in America, to produce a system entirely original.

Doctor Samuel Johnson, of Connecticut, first president of King's, now Columbia college, in the state of New-York, was remarkable for having espoused, after having been brought up in another persuasion, the doctrines of the episcopalian church; and that, entirely, from the spontaneous operations of his own mind. His interesting biography is extant, written by his friend Dr. Chandler; and published under the inspection of the right reverend Dr. Hobart, bishop of the protestant episcopal church of the state of New-York. Dr. Johnson was a gentleman remarkable for his learning, at a time when learning was rare in America. His work, entitled "Noëtica," was published by Dr. Franklin, in Philadelphia, before the encyclopædia of D'Alembert appeared. It was, afterwards, published in London, with the suppression of the title. It contains an original division of human knowledge, and an elegant classification of the sciences. This system was published again in London, in the year 1767; as an appendix to his Hebrew grammar.

246. Produces the best sys-

No partiality for my country, or my countrymen, but a sincere veneration for truth, induces the declaration; that of all the systems which

have hitherto appeared, whether in ancient times, or in modern days, that of Dr. Johnson is esteemed the best. The analysis is wonderfully close. It is astonishing how much is comprized in the system, and in how small a space, and with what correct arrangement. The whole is marked with one of the singular qualities of the American character, sound unerring good sense. No licentiousness, of principle or of imagination, will be discovered; no vanity, no pedantry, no affectation. Neither the system, nor the author, such was the humility of our country, ever attained any celebrity; and, yet, the system is infinitely preferable to that of Lord Bacon, with all the improvements effected by D'Alembert. The unassuming American mind, operating with its native clearness and dignity, takes a flight beyond the proudest genius of Britain, and of France.

tem extant.

247. Explanation of his system.

Dr. Johnson entitles his short system "a general scheme for the partitions of the sciences, according to the natural order of things; or, a synopsis of all the parts of learning."

For learning in general; implying the knowledge of every thing, whether speculative or practical, which is conducive either to our present felicity, or to our future happiness; he adopts, from the Greeks, the term *cyclopædia.*

To know, and to practise, these are the two ingredients of our happiness; and constitute the essential means without which the great end cannot be pursued.

The distinction between *sciences* and *arts*, characterized by perplexity and inutility, is entirely neglected; and knowledge is regarded as holding, throughout, its speculative and its practical parts in inseparable combination.

All human knowledge is then reduced to two grand and capital departments. The first of these is that of the belles lettres. The second is that of philosophy.

The department of the belles lettres, or of philological arts and sciences, is divided into general and special. Grammar is correctly placed at the portal of the temple of science. The application of language to the gratification of taste, the investment of it with embellishment and beauty, elegantly, next occupy the attention. The alliance of rhetoric and grammar, which are common to all kinds of speech and of composition, closes the division of general philology. Four interesting, and well deduced, and well defined sciences, limit the range of special philology. These compose the fine and attractive family of eloquence, history, poetry, criticism. Six particular and specific sciences have the common base of human language, and exhaust the great province or department of philology, or belles lettres; the knowledge and study of *words*, as instruments and means, to be applied, in the hands of man, in order to understand the nature of *things*.

Philosophy; the second great province or de-

partment of human learning, embracing the knowledge of things, and a correspondent rectitude of action; is divided into natural philosophy and moral philosophy. Truth and wisdom are the results produced. The natural and the moral world, material and intellectual beings, constitute the whole universe.

Arithmetic is here, again, with equal propriety, placed at the portal; and is allied to geömetry. They compose mathematics; and are precedent to mechanics, to physics, and to astronomy. These three latter sciences take in the whole material universe, and exhaust the natural world.

Metaphysics and ethics are the two branches which arise from the intellectual and moral world. Logic, pneumatology, and theology, compose the first; and ethics proper, œconomics, and politics, the last. Seventeen important and conspicuous specific sciences are deduced, admirably concatenated, and judiciously named. Viewed as a whole, the system of the reverend Dr. Johnson transcends in solidity, and in beauty, every scientific edifice of antiquity; and all the structures of Bacon, of Locke, and of D'Alembert.

248. Linnæus.

Short is the excursion, though not unpleasant nor unprofitable, that the mind has been allowed to take in the western hemisphere. It is soon recalled to Europe, that interesting portion of the globe, which has so much engrossed, and will continue so much to employ, the scientific attention of mankind. And it is recalled by an object

of no ordinary dignity. It is the pride and the glory of Sweden. It is Linnæus.

To this name, in preference to every other, a grateful homage has been rendered; as one of the most illustrious cultivators of science the world has produced. No man, of either ancient or modern times, has so much contributed to extend our acquaintance with the works of nature, on this globe. Endowed with an uncommon portion of genius; possessed of the richest imagination, restrained within proper limits by a correct judgment; blessed with a persevering and virtuous industry, which qualified him to accomplish whatever plans of usefulness or glory his sanguine mind devised, which enabled him to triumph over poverty, and the active malevolence of enemies; thrice happy in an ardent and well-directed ambition, without which the energies of mind are, oftentimes, of little avail; the naturalist of Sweden has assumed one of the highest stations on the throne of intellectual glory. The world will for ever regard with veneration, and with wonder, those powerful and successful efforts, which called natural history from an embriotic and misshapen state, into form, and regularity, and beauty; and placed it, in the most elevated rank, among the sciences which have attracted the notice of mankind. Such are the compliments paid to Linnæus, by one worthy of delineating the portrait; by one who followed with distinction in the same career; by him, whom Pennsylvania now mourns, with tears, the American Barton.

The genius and intrepidity of Linnæus have rendered a dead language of more service, in living hands, to science, than all the writings which it contains. No pure and original language could, by any possibility, be now competent to attend the human mind in its daring flight. A sort of universal and scientific language is rising, infinitely better than that which the philosophic bishop of Chester would have devised; a language possessed of, what would have been deemed incompatible qualities, uniformity and variety, stability and flexibility; and as intelligible, as it is accurate. Of the scientific purposes to which the Greek language was capable of being applied, the learned world were by no means sensible, until the brilliant examples of Linnæus, and of the chemists of France, had been displayed. 249. His merits.

Though no classification of the sciences themselves was attempted by Linnæus, he has afforded the finest instance of the classification of the objects of a particular one; and his grand and happy exertion, in nomenclature, has placed a new instrument in the hands of science.

Some eminent, and constantly exercised minds; though not directly employed on the classification of the sciences; have yet, incidentally, and by an unexpected and collateral irradiation, imparted a flood of light. Of this description was Mr. Hume. 250. Mr. Hume.

Mr. Hume; after observing that a strong genius succeeds best in republics, and a refined taste in monarchies; proceeds, though entirely in-

cidentally, to make a complete division and distribution of the subjects of human knowledge.

According to the system of Mr. Hume, the knowledge of man would come out into six great sciences, or departments of science. The three first would be, religion, politics, and metaphysics. Morals, mathematics, and natural philosophy, would follow. Such, it is imagined, would be the number; and such the order.

A few interrogatories will test the merits of this arrangement. Let these six great sciences, or departments of science, be dilated! Where are the belles lettres? Where are the arts? Is history doubtful? Is medicine, or war?

251. Dr. Robertson.

The liberal friend of Mr. Hume, liberal as a divine, liberal as an historian, and alike a glory to Scotland, at a much later period, makes a division of the sciences; which, from its being, in a similar manner, entirely incidental, and on account of the resemblance of its features, will be here noticed.

In the luminous historical disquisition, concerning the knowledge which the ancients had of India, Dr. Robertson finds occasion to make a distribution of the sciences.

According to the system of Dr. Robertson, the knowledge of man would come out into four great sciences, or departments of science. These would be; religion, logic, ethics, and physics.

Associated in the circumstances of incidental reflection, of intrinsic resemblance, of contemporaneous celebrity, and of Caledonian honour; is what is observed on this subject by Dr. Adam Smith. 252. Dr. Adam Smith.

In the fifth book, of the discussion on the wealth of nations, Dr. Smith observes that the ancient Greek philosophy was divided into three great branches, physics, ethics, and logic; a division which obtains Dr. Smith's entire approbation. Here, like Mr. Locke, like Dr. Campbell, like Professor Dugald Stewart; Dr. Smith approves of the subjects of the divine and the human mind being arranged under the head of physics.

This system is essentially the same with that of Mr. Locke. I dare not contradict so well-informed a mind. Yet no authorities are given for attributing this division of the sciences to the ancient Greek philosophers. I am not able to recognize any such division among the Greek philosophers. To the superior information of the European mind the question must be eventually referred. For the present, the identity appears evident, and Mr. Locke's property equally unquestionable. The course of philosophical education in the universities of Europe, in admitting the five great sciences of, logic, ontology, pneumatology, moral philosophy, and physics, seems to have been founded in an original distribution; and not on a corruption of an ancient system. Mr. Locke's division of the sciences was a refor-

mation, indeed, of the antecedent scholastic distribution; but in reducing the intellectual world into those three great provinces, of physica, ethica or practica, and logica, it appears to be an entirely original system. Nor would a mind, rich like that of Mr. Locke, condescend to borrow, while it proudly disdained to acknowledge obligation.

Since we have got into the agreeable society of the Scottish literati; may it not be advisable to pursue this subject, to its termination, in relation to that country? As all the systems, which remain for investigation, are, comparatively, recent; a geögraphical, rather than a chronological association, may abbreviate the discussion.

253. Dr. Beattie. Dr. Beattie, in his elements of moral science, divides human knowledge into, history, philosophy, mathematics, and poetry. Philosophy consists of two parts, the philosophy of body, and the philosophy of spirit or mind; or natural and moral. Every science has a speculative and a practical part. The speculative part of moral philosophy is called pneumatology. It consists of theology and psychology. The practical part consists of moral philosophy, strictly so called, and logic. Moral philosophy, strictly so called, comprehends, ethics, œconomics, and politics. Rhetoric is part of logic.

254. Dr. Reid. It has not been observed that Lord Kames, in his numerous investigations, attempts any general division of human knowledge. His friend, however, Dr. Reid, amply supplies the deficiency.

It may, indeed, be remarked that Lord Kames; and in this he is probably the first; ranks *ornamental gardening* as one of the fine arts. Hence it would follow sculpture, and painting, and architecture, according to the system of M. D'Alembert, into the province of poetry; increasing, still more ludicrously, the confusion of division and nomenclature already reigning in that department.

Human knowledge is reduced by Dr. Reid into two general heads; according as it relates to body, or to mind; to things material, or to things intellectual. These are the two great kingdoms of nature; and about the one, or the other, or things pertaining to them, every art, every science, and every human thought, is employed; nor can the boldest flight of imagination carry us beyond their limits. There are, therefore, two great branches of philosophy; one relating to body, the other to mind. The properties of body, and the laws that obtain in the material system, are the objects of natural philosophy. The branch, which treats of the nature and operations of minds, has by some been called pneumatology. To the one, or the other, of these branches, the principles of all the sciences belong. Accordingly, the sciences may be distinguished into two classes; one appertaining to the material, and the other to the intellectual world. The various parts of natural philosophy, the mechanical arts, chemistry, medicine, and agriculture; belong to the first. Grammar, logic, rhetoric, natural theology, morals, jurisprudence, law, politics, and the fine arts; belong to the last.

255. Dr. Campbell.

Entirely opposite to Mr. Locke, to Dr. Adam Smith, to Professor Dugald Stewart, to Dr. Campbell; and, as they will have it, to the whole host of ancient philosophers; Dr. Reid will not make theology a part of natural philosophy. Under the term physiology, Dr. Campbell would include; natural history, astronomy, geögraphy, mechanics, optics, hydrostatics, meteorology, medicine, chemistry, natural theology, and psychology.

256. Professor Scott.

Professor Scott, of Aberdeen, in his elements of intellectual philosophy, or analysis of the powers of the human understanding, divides the objects of general knowledge, into two classes; the material and the intellectual. The intellectual class would comprehend; the human mind, the minds of brutes, the supreme or divine mind, and metaphysics. Metaphysical science is composed of; politics, jurisprudence, ethics, and pneumatology. An observation is made which is pregnant with much import. He remarks that history, voyages, and antiquities, are branches of knowledge, which have, occasionally, been considered as *scientific*.

257. Professor Barron.

Professor Barron, of St. Andrews, is immediately after Professor Scott, in his lectures on belles lettres and logic. He takes a general view of human knowledge, and deduces the sciences in a beautiful manner. His first division is into sciences and arts, of which, respectively, he furnishes definitions; but General Bulow, in his "spirit of the modern system of war," is fully as clear in defining the limits between these two

departments as the professor of moral philosophy. Professor Barron then reverts to the Lord High Chancellor of England; and adopts the division referring to memory, imagination, and judgment. After making *geography an art*, it comes out that the *theories of all the arts are sciences.* He introduces a remark, which is common to all who have experienced embarrassment in the arrangement of human knowledge; that *the arts and sciences run into one another.* He concludes that if all the sciences, and all the arts, appear somewhere, it is immaterial where they appear; or in what manner, or order. He is the very first to take a step beyond the authoritative positions of Dr. Reid, and to consider the universe as composed not only of matter and mind, but also of matter and mind in union; a principle, on which if he had set out, and entirely abandoned Lord Bacon, it might have conducted him to more clear and satisfactory results.

258. Mr. Walker.

A few years after the publications of the preceding authors, Mr. Alexander Walker commenced the delivery, at the Lyceum, in Edinburgh, of public lectures on this very subject. His title exactly describes the object; "*the natural system of universal science.*" An implicit dependence and a regular succession, it is, with equal truth and judgment, affirmed, subsists among the sciences; and that when these are violated all their relations are lost, and no consistent and natural system is produced. The memory is burthened with innumerable unconnected phænomena, and can

retain no permanent impression of them; and, as they are not viewed in connection, all general induction, and great improvement in science, are rendered unattainable. The construction of a system of science altogether new is necessary. Science is now all dictionary, and no system. The continent of Europe is impatient for this improvement. The members of the national institute of France, in their report on the progress of the sciences, of the twentieth of February 1808, assert that this can only be effected by Bonaparte; who might create a work, which would surpass in extent that of Aristotle, as much as his actions surpass in splendour those of the Macedonian conqueror. Mr. Walker is, however, of opinion that the genius of science never yet obeyed the nod of a tyrant; and that the French nation is incapable of such a work. There exists, on the face of the earth, no nation capable of executing this great task, but the British. The Britannic islands contain more of mind than all the world besides. Nor yet are all the parts of these islands, by any means, on a footing of equality. Hibernian, Cambrian, Anglian science, bow before the mighty genius of Caledonia. From their more general illumination, no people could, with such facility, construct a natural system of universal science as the people of Scotland.

259. His system.

Mr. Walker proceeds, after complaining of the indefinite language of science, to criticise the systems of Lord Bacon and Mr. Locke. Of Lord Bacon his criticism is very ingenious, and

appears perfectly correct. There is so great a deviation however in regard to Mr. Locke, as, with other circumstances, to induce a belief that Mr. Walker's mind was not properly constituted; nor ought the patronage of the Earl of Buchan to contravene the inference. His lordship was, at that period, less expected to exercise a discriminating judgment on the merits of an enterprize, than he was regarded as qualified to sustain the part of the Mæcenas; in relation to every project which might, by any possibility, advance the interests of science, and of his country. Mr. Walker accuses Mr. Locke of two errors, that of placing the *semiotica* before the *practica;* and of giving none of his divisions developement. The latter could not be any error, as it was a matter of choice. The former accusation evinces the extreme confusion of Mr. Walker's mind. Mr. Locke does not place the subjects referred to in the order which is asserted. Mr. Walker on the contrary himself does, and it will be, eventually, found that it is no error. Perhaps he intended to say, the reverse of what he does; that it is an error in Mr. Locke not to have placed the semiotica before the practica. The same, or a greater, confusion of mind is evinced, in relation to the arts. It would at first appear that they are distinct from the sciences; and afterwards that the fine arts, sculpture and painting, and others, are parts of literary science. Metaphysics, at first, relates to matter, its qualities, and its motions; afterwards to mind, and afterwards to geömetry. Theology seems to disappear, and some other subjects are very ambiguous.

In the system of Mr. Walker science is divided into physical and moral. Physical science is subdivided into metaphysical, general physical, and particular physical. Moral science is subdivided into literary, moral strictly so called, and political science. The result of their combination is *one universal science.*

The language of Mr. Walker is extremely indefinite. Of other systems, it is sometimes difficult to understand the terms, until they have been explained by definitions. In this system, on the contrary, the terms are sufficiently intelligible; but the definitions are entirely the reverse. History and politics are intelligible terms, but who would recognize those familiar subjects under such a kind of definition as the following; *the relation of the effects, which the use of the signs, by which are communicated the impressions on the mind of man, which are received from the various mineral, vegetable, and animal beings, with which he is surrounded, produces on the conduct of nations, and the deductions which we form from the general results of that conduct?*

260. The Britannic encyclopædia.

After the systems of individuals, may succeed those of bodies of men; and, here, may be noticed the Encyclopædia Britannica. This is, in general, one of the best written works in the English language; and is the most truly scientific great work in any language. It is much superior to the French encyclopædia. In order to be fairly and fully convinced of this; let any person contrast the articles anatomy, astronomy, and various

others, in the two encyclopædias. It is to be regretted that the names of the respective writers do not regularly appear. A more virtuous, or a more learned body of men, have never been associated. This great work gave rise to the American encyclopædia; which, with the addition of some valuable original matter, excels the primary work in typographical execution, exhibiting better paper, and better engravings; and shewing, conclusively, the state of the arts, connected with literature, to be farther advanced in America, than in any other country. It is a fact, not a little remarkable; that the American people are supplied with the best encyclopædia, both for matter and execution, that is extant.

In relation to the division of human knowledge, the Encyclopædia Britannica affords evidence of a variety of hands, by a want of uniformity in sentiment. The editors of that work, in the preface; like M. D'Alembert, in the preliminary discourse of the French encyclopædia; assert that the division of human knowledge, in a correct manner, is impossible. They represent the attempt as even *presumptuous*. They appear to take it for granted that such a division must be founded on *categories*. And yet, in their own work, it may be said that there are, perhaps, three divisions of human knowledge, each of them very respectable; and none of them founded on the categories. In the first place, their reader will observe in the alphabetical succession of their articles, certain minor articles, recited in the margin of their columns, and certain other more important articles

recited at the summit of the page, covering both its columns; a distinction of which, in the body of the work, the reasons are not assigned. If from the whole work, including the Supplement, these *majuscular* terms, if that denomination may be applied to them, be selected, they will be found to contain almost the whole of human knowledge, distributed into great departments, or, if the term be preferred, *specific sciences;* and presented in alphabetical succession. There are only two exceptions, which have perhaps arisen from the variety of hands, more than from design; and these are the articles *paper* and *river*. Every other forms a science, or an art, or an important department of human knowledge; and they amount to about ninety.

261. Its merits.

If the investigator will have the curiosity to contrast this alphabetical deduction of the sciences against the subordinate dictionaries of the second, or methodic encyclopædia, of the French, the superiority of the analysis, in the Britannic encyclopædia, will strike him with astonishment. Many of the articles thus honoured in the methodic encyclopædia are frivolous in the extreme. If any principle of concatenation could have been discovered; other than the succession of the letters of the alphabet which commence the words, and which indeed Dr. Reid ridicules as the *categories* of the *encyclopædists;* it would have led, eventually, to an arrangement of human knowledge. In the cyclopædia of Dr. Rees this latent and unexplained, but not unimportant principle of analysis, is neglected; and the minor terms

of the Britannic encyclopædia, where the discussion is in any degree protracted, become majuscular terms in that work. The Encyclopædia Britannica, under the article philosophy, makes a very handsome approach to a division of human knowledge. It does the same under the article metaphysics.

262. The Perthensian encyclopædia.

The Encyclopædia Perthensis, in the preface, speaks of certain departments of knowledge; such as history, and others; as not being *sciences*. It would still less include them under *arts*. Thus there would seem, in corroboration with the remark of Dr. Scott, to be some term wanting in language; anterior to the invention of which a complete and satisfactory arrangement of knowledge would be impossible.

263. The society of advocates.

There is another mode by which an arrangement of human knowledge might have been brought out, analytically; and that is, by the collocation of subjects, as it would be found most convenient, in practice, to arrange the books containing discussions on them. In this light may be regarded the distribution of the society of advocates, which has been justly regarded as an analysis of a very superior character; and of which the honour is perhaps principally attributable to Mr. Mackenzie. The catalogue of the library of the writers to his majesty's signet, as compiled by one of its curators, would display all the subjects of the anthropic intellect, as distributed into five grand classes. These are; theology, jurisprudence, sciences and arts, belles lettres, and his-

tory. These five great and comprehensive classes fall into fifty branches, which are stiled divisions; each of which is again subdivided into sections. The collocation is throughout very elegant, but the indefinite import of many terms in language produces ambiguities. Are government and politics parts of jurisprudence? Are physics no part of philosophy? Have grammar and rhetoric become, at length, neither *arts* nor *sciences?* Is religion only a part of ecclesiastical discipline? Is geögraphy history? Is chronology? Is biography really the daughter of history, and does the world err in so often regarding them as sisters?

264. The Edinburgh Reviewers.

From the engaging and fascinating society of the literati of Scotland we ought now to be at liberty to make an excursion into South Britain. But we are arrested by the reviewers; and a heavy tribute is exacted, for entering these dominions. Nor will the occasion be an improper one for discharging the balance of some former American accounts.

265. The pride and insolence manifested by them to the people of the United States of America contrasted with the respect

Criticism was once a *useful* and an *honourable* occupation. It was *useful*, in announcing every attempt to enlarge the boundaries of literature; and, though, in general, unnecessarily severe, aided much in forming a correct estimate of the value of every important exertion. It was *honourable*, because the critic dealt on his own funds and capital; and did not rob his customers, to create a fictitious original credit for himself. At present, on the contrary; such doubtless are the deplorable effects of that revolutionary and disor-

ganizing spirit which pervades society; critics are no longer the heralds of the literary forces, but assume the office of commanders and generals. When an original work is produced, instead of a candid investigation of the service which it may have rendered to the cause of learning, the critic sits down and writes an original discussion on the same subject; though he perhaps never before had investigated it, or thought of favouring the world with his sentiments on it. The last production is naturally the best, and the critic, of course, abuses his author, for not having written one equally good; though, perhaps, not only the very best materials of the latter have been supplied by the former, but even the subject itself thus alone suggested.

and politeness of France

Formerly, whole nations and bodies of men were treated with politeness and respect; particularly, by those who occupied no higher position in society than the station of critics. At present, not only authors truly original, and pursuing honourable objects by honourable means; but whole nations and bodies of men, are treated by petty critics, with pride and insolence. No stronger instance has been presented than between the people and inhabitants of the United States of America, and the reviewers of Edinburgh. Our country is represented as the residence of barbarians. Gross ignorance alone characterizes our whole people. An American has not intellect sufficient, according to the representations of the Edinburgh reviewers, to understand the Latin for *honey;* or to discover the Greek for a *shoe.* The

labours of the American philosophical society are impertinently and arrogantly ridiculed. Our late venerated fellow citizen, Dr. Barton, one of its most active members, is stiled, contemptuously, *one Smith Barton.* It is amply sufficient to stigmatize any thing scientific that it is American; and our great country, and its bold and manly people, are required to bow, with submission, at the sight of the *ferula* and the *fescue*, in the hands of a little and puerile Caledonian critic. There is a spirit in America which would resent, if it were not amused by, this petty insolence. The pride and insolence manifested towards America, by the Edinburgh reviewers, is strikingly contrasted with the respect and politeness, which she uniformly experiences from France.

266. A society of English gentlemen.

In England there appeared, shortly after the French encyclopædia, a dictionary of arts and sciences, by a society of gentlemen. So little were these English literary gentlemen satisfied with the adoption from their country made by D'Alembert, that they undertake an entirely new and original system. About sixty-six specific sciences or departments are brought out in a very handsome manner. All knowledge is, in their view, general or particular. The first they would name metaphysics. It would comprehend; ontology, pneumatology, physics, and chronology. Physics would be divided into mathematics and physiology. Arithmetic, algebra, and geömetry, would compose the former, and dynamics and mechanics the latter. Fourteen sciences, some of which, like those of Mr. Chambers, are at the same time genus and

species, would exhaust the general objects of knowledge. The particular objects of knowledge would occupy fifty-two sciences; concatenated by the four distinctions of divine and human, natural and artificial. Two, under the names of theology and religion, would be embraced in the first. The branch of human includes no less than twenty-one; and not a single one is misplaced. Sixteen are in the natural branch, and it is only doubtful, whether agriculture, gardening, and husbandry, do not, as much as anatomy, medicine, pharmacy, chemistry, surgery, cosmetics, and gymnastics, appertain to the preceding; and where navigation ought to be disposed of. The last branch is of very dubious character. A serious dissention has arisen among the fine arts. Music has separated herself from painting and architecture. The latter are now no longer poetry. Sculpture has sought foreign protection. Diet, dress, and equipage, have become the companions of architecture, fortification, and ship-building. In all, but the last branch, the associations are natural; and the arrangement perspicuous. The authors do not, however, undertake a practical adoption of the system, but adhere to the alphabetical order; and, as they very carefully connect the several subjects by references; as too great minuteness, on the one hand, and too great diffusion, on the other, are judiciously avoided; and as the whole work is succinct, comprizing but four volumes; if it were not for the discoveries and improvements which have been since made, it would be found the most convenient scientific compendium, which is extant.

267. Sir William Jones.

Sir William Jones made a division of human knowledge. His provinces are; history, arts, sciences. History is either of man or of nature. The arts are four; rhetoric, poetry, painting, and music. The sciences are three; law, mathematics, and dialectics. Every species of human knowledge, he remarks, may be reduced to one or other of these divisions.

268. Dr. Turner.

A distribution much more elaborate was formed by an English gentleman of erudition; Dr. Turner, of Magdalen Hall, Oxford. His provinces are; religion, arts, sciences. The arts are scientific or mechanical. The *scientific arts* are; philosophy, rhetoric, grammar, mathematics, astronomy, painting, music, and sculpture. These eight he would call the liberal arts. The first would include; logic, morality, physics, metaphysics. The sciences are also eight; theology, philosophy, jurisprudence, medicine, rhetoric, grammar, poetry, mathematics. Medicine would include; anatomy, surgery, pharmacy, chemistry, botany. Mathematics would here include; arithmetic, geömetry, architecture, astronomy, and mechanics; and, if he is not misunderstood, commerce would be annexed here. The double occurrence of some names and subjects is attended with embarrassment. The expression *scientific arts* appears here, probably, for the first time.

269. Dr. Willich.

Dr. Willich, in his domestic encyclopædia, under the article *encyclopædia*, appears to be deeply sensible of the necessity of an arrangement. He distributes all human knowledge into sixteen

principal departments; which are very comprehensive, and generally very distinct. Under the article belles lettres, he endeavours farther to reduce a pretty extensive range. He is the first, distinctly, to point out *the necessity of a nomenclature.*

270. The royal institution.

The royal institution of Great Britain have undertaken an arrangement. It does not differ, in principle, from that of the writers to his majesty's signet in Scotland; but the subdivision of the third great class, that of sciences and the arts, is entitled to a decided preference.

271. Mr. Horne.

The last, in this arduous career, is Mr. Horne; who, in his very late and elegant bibliography, makes a distribution into four provinces or classes. His subject constitutes the first of these. History, philosophy, and literature, follow. As a scientific distribution, the system would have been better, if Mr. Horne had adhered to his own judgment; and not submitted to that of his French predecessor. Bibliography would not then have formed a separate and distinct class; and would have been comprehended in that of literature.

272. Castel.

Prosecuting the plan of a geögraphical association of the remaining systems, it will be necessary now to return to France.

The very ancient system of Castel has never been, as is believed, in America.

273. Verdier. The system of Dr. Verdier has already been noticed. Three circumstances render it interesting. It is directly on the subject; the professed object being the systematization of human knowledge. It criticizes that of D'Alembert; which immediately preceded. It is friendly to the categories. Dr. Verdier died at Paris in 1759, and his work was reviewed in England in 1774. It is not known to be in America.

274. De Bure. William Francis de Bure, an eminent bookseller of Paris, died in 1782. He published a treatise on scarce and curious books, in seven volumes octavo, in 1766, and a typographical museum in 1775; productions exhibiting not only great industry, but ingenuity and genius in his profession. The late president of the United States, on a journey from Monticello to Enniscorthy, May the twenty-second, 1814, referred me to this system; and I since find it mentioned by Mr. Horne in his bibliography. I have not been able to meet with it.

275. The methodic encyclopædia. The methodic encyclopædia has also already been adverted to. The subordinate dictionaries amount in number to forty-two. These forty-two articles, however; which ought to have been expected to present human knowledge, with some dignity; are farther removed from a deduction of either general or specific sciences than the cyclopædia of Mr. Chambers, in the preface; than the society of English gentlemen, in the dictionary of arts and sciences; and than the Britannic encyclopædia, in its majuscular articles.

In this point of view, some of the articles of *l'encyclopédie méthodique* are surprizingly frivolous. Let the following be taken as examples; *amusemens des sciences*, *assemblée nationale*, *chasse*, *encyclopediana*, *equitation*, *forets et bois*, *jeux mathématiques*, *jeux mathématiques et familiers*, *péche*. Morality has merely the honour of being associated with logic. Natural history, on the contrary, claims three distinct dictionaries; one of them for worms alone. The arrangement and exhibition of human knowledge, in forty-two subordinate dictionaries, rather increases, than lessens, all the inconvenience and confusion of the original dictionary form; and, if the public taste is not misapprehended, in relation to this gigantic work, a preference is given to the *unitarian* form. Certain it is, that Dr. Rees, and Dr. Brewster, who were well qualified to judge, and both of whose invaluable works are now republishing in America, have adhered to the latter; and, probably, in France itself, the party of the *quadragintarians* will be exposed to the consequences of a counter-revolution.

276. La Harpe.

The object of a scientific classification appears to be still perseveringly pursued. The third volume of the Revolutionary Plutarch takes notice of a public occasion when Cambacérés delivered a speech, with respect to the classification of the several branches of science; which, it is observed, was replete with good sense. This is supposed to have been the production of La Harpe. This production is not known to have yet reached America.

277. The Lyceum. There is one mode, in which systems; that do not come, directly, under view; may, notwithstanding, be, in some degree, indirectly, estimated. It may be fairly presumed that in any country; abounding, as does France, with the most extensive and most accurate information; when a public institution undertakes the execution of a particular literary task, all the previous and less perfect attempts to attain the same object will have undergone an examination and review. The merits therefore of all preceding systems may be inferred to be concentrated in the arrangements of human knowledge made by two distinguished scientific institutions in France; the Lyceum, and the National Institute.

278. Its system. The Lyceum divides human knowledge into eight great departments or classes. The first is that of political economy. It embraces; the social arts, the art of government, the law of nations, foreign commerce, and trade in the interior. The second class is that of rural economy. It includes; agriculture, the melioration of soils, forests, horticulture. The third class is that of mathematical science. It is divided into two branches; general mathematics, and particular mathematics. General mathematics comprehend; algebra, geömetry, trigonometry, with their application, astronomy, fortification, tactics, nautical subjects. Particular mathematics comprehend; arithmetic, foreign exchange, banking, book-keeping, their application, general mechanics, statics, dynamics, optics. The fourth class is that of general physics. It comprizes; natural history, zoölogy, botany, minera-

logy, anatomy, physiology, medicine, chemistry. The fifth class is that of experimental physics. It contains; meteorology, optics, electricity, and magnetism. The sixth class is that of the polite arts. It grasps; drawing, painting, sculpture, architecture, engraving, music, dancing, the drama. The seventh class is that of the belles lettres. It holds; general grammar, languages, rhetoric, geögraphy, history, antiquities, numismatography. The eighth class is that of technology. It relates, exclusively, to arts and to manufactures. This is a detailed statement of the arrangement made by the Lyceum. From circumstances, it is presumed not to differ, materially, from that of La Harpe.

279. The National Institute.

In the year 1798, there was printed, in French, at Hamburgh, an entertaining work under the title of "Fragments on Paris," by Dr. F. J. L. Meyer; translated, by General Dumouriez, from the German. The arrangement of the sciences made by the National Institute of France is extracted from this work; being more accurate than the second supplementary volume of the Britannic encyclopædia, on this subject.

280. Its two systems.

The National Institute is composed of one hundred and forty-four members, resident in Paris, and of one hundred and forty-four associates, diffused over the then republic. There are eight foreign associates in each class, twenty-four in the whole. Some of these were kings; and the President of the United States of America was also one. The Institute was divided into three classes.

The first class of the National Institute of France was stiled the class of physical and mathematical sciences. It was divided into ten sections. These embraced the following subjects; mathematics, mechanic arts, astronomy, experimental physics, chemistry, natural history and mineralogy, botany and vegetable physics, anatomy and zoölogy, medicine and surgery, rural economy and the veterinary art.

The second class was stiled the class of moral and political sciences. It was divided into six sections. These comprehended the following subjects; the analysis of sensations and of ideas, morality, social science and legislation, political economy, history, geögraphy.

The third class was stiled the class of literature and the fine arts. It was divided into eight sections. These comprized the following subjects; grammar, ancient languages, poetry, antiquities and monuments, painting, sculpture and architecture, music and declamation.

Such is the detailed statement of the arrangement of human knowledge, made by the National Institute of France, at its original formation.

By the year 1812 the class of morality and politics was found to be troublesome; and rather inconvenient. It had been, therefore, abolished. So far from diminishing the number of classes, by this operation, they were increased. There were substituted, for the proscribed class, two classes;

the first, the class of the French language and of French literature; the second, the class of history and of ancient literature; and the fine arts were again, by imperial authority, divorced from poetry. Painting, sculpture, architecture, and music, now left alone in the last class, were, in recompense, honoured with a new sister, engraving; and *the National Institute of France*, by virtue of a second baptism, now became *the Imperial Institute of sciences, letters, and arts*. Geögraphy, banished from its associates in the class of morals and politics, was allied to navigation; and received into the family of the mathematical sciences.

281. Criticism on the French systems.

In the arrangement of the Lyceum, morality entirely disappears; and, with it, religion, theology, and the philosophy of the human mind. Not even logic is spared. Manufactures are at one extremity of the scale; and commerce and agriculture at the opposite. There would come out about fifty-two particular sciences or arts. Some of these, as such, are frivolous. Melioration of soils, forests, foreign exchange, banking, book-keeping; are instances. The fine arts are now named the polite arts; and the drama, dancing, engraving, and drawing, are admitted into the family. The parts of natural philosophy, and of mathematics, are strangely dispersed. Geögraphy assumes her rank in the belles lettres.

The arrangement of the Institute would give twenty-four distinct departments; the scale commencing with mathematics, and terminating with

music. Not a single one is marked with frivolity. It admits morality; but is still intolerant to theology. The whole class of morality and politics, which consists of only six parts, is badly composed. It commences with, what is presumed to be, a circumlocution for either the logic, or the psychology of other systems; and terminates with geögraphy. If the mechanic arts, which are included among the mathematical sciences, are intended to denote manufactures; they are widely separated from commerce, if this is embraced by political economy, in the class of morals. *Jurisprudence* complains of her fate, both in this and in the preceding system; but expiring *metaphysics* retains not energy even to complain. *Theology* expected a violent death; but, what the world will learn with surprize, *philosophy* has died a natural one. The latter term has perfectly vanished from both these systems of France.

282. Brunet. Abandoning every preceding attempt, in the year 1814, that of the society of advocates in Scotland was adopted at Paris; as it had previously been, in the year 1809, at London. The *manuel du libraire et de l'amateur de livres*, in four volumes, by the younger Brunet, is the most finished work of the kind which has ever appeared. It pursues the division of the five great classes of Mr. Mackenzie; theology, jurisprudence, sciences and arts, belles lettres, and history. Theology is thus restored to France, and honoured with the precedence of intellectual rank. Thus the happy deed, at Edinburgh, of the fifteenth of May 1805, was expanding its utility.

His serene highness the Margrave of Baden devised a methodical table of the principles of political economy; which was reduced to actual execution, at Paris, by M. Du Pont de Nemours, in very superb stile. Ingenious and comprehensive, and holding in its grasp more than its title would indicate; its object is notwithstanding partial, and a succession of specific sciences is not attempted to be deduced. 283. The Margrave of Baden.

Of a similar character, and therefore here noticed, were the still more elegant and superb tables, forming fourteen large and splendid engravings, published some years before, by Mr. John Stewart, at London; and dedicated to Dr. Franklin, under the title of "the Senator's Remembrancer." They cover an immensity of human knowledge; but do not, like those of the Sieur de Lesclache, amount to an attempt of deducing the sciences in a regular system. 284. Mr. Stewart.

It remains to cast a glance over the rest of the continent of Europe. 285. Baron Bielfeld.

Baron Bielfeld, too long neglected, demands the first attention.

This Prussian nobleman digested a copious, an entertaining, and an instructive work, under the title of "the Elements of Universal Erudition," containing an analytical abridgment of the sciences, polite arts, and belles lettres; dedicated to the distinguished prince, who now wields the

sceptre of the Britannic kingdoms. Under the extensive term of erudition, he would include the knowledge of every thing, within the comprehension of our faculties; all useful arts, all trades, all sciences, even those of a less important nature. He restricts his personal enterprize to an assemblage of all the sciences and liberal arts, observing that no system was yet known that comprehends the whole; and presents them in a natural order, from one point of view. Unlike Lord Bacon, unlike Mr. Locke, in attempting, on a new and an original plan, to reduce the chaos of universal erudition, he is not afraid to enumerate the anterior divisions which had been essayed; and to render them susceptible of a comparison with his own. The first which he notices is a partition of the sciences, which had been made by some of his precursors, into the *necessary*, the *useful*, the *agreeable*, and the *frivolous;* and he assigns the judicious reasons on which he rejects it. With equal propriety, he will not admit another, consisting of only three provinces; the languages and the liberal arts appertaining to the first, and the succeeding composed of the *preparatory* sciences, and the *superior* sciences. A system which is founded on the nature of *certainty;* which is presumed to consist of three degrees, *mathematic* or demonstrative certainty, *philosophic* certainty, and *historic* certainty; while he fairly admits the justness of the distinctions, he assigns satisfactory and conclusive reasons against the adoption of. The division of *erudition*, by the French authors, into *sciences* and *belles lettres*, by

no means, obtains his approbation. He exposes, in a manner the most forcible, the confusion which reigns throughout the belles lettres of M. Rollin.

286. Improves on Lord Bacon, and on D'Alembert.

He then reforms the great system of Lord Bacon; and, arranging the faculties of the human mind in a new order, he assigns every science, and every art, to one of three classes. The first class treats of those sciences that employ the *understanding;* the second, of those that are derived from the *imagination;* and the third, of those that exercise the *memory;* a succession which is unquestionably more convenient than that of Lord Bacon, and more philosophical than that of D'Alembert. His other and subordinate reformations are equally judicious. Natural history is very properly taken from the province of history, where the association of a mere word had placed it; and ranged as a part of the sciences that relate to the understanding. The subjects are all well arranged, and properly associated. He deduces about ninety specific and particular sciences; if each chapter of his discussion may be considered as presenting the basis of one. What is very remarkable, and is a perfect test of the merit of the system, is; that, though without classes, yet, the classes of the writers to his majesty's signet, in Scotland, if applied to the divisions of Baron Bielfeld, will come out in the same exact number, with nearly the same names, and in the same exact order. The first eleven divisions of Baron Bielfeld would go to the class of *theology;* the next fourteen to that of *jurisprudence;* the succeeding twenty-four to the *arts* and *sciences;* the ensuing thirteen, with the

exception of the fine arts, which had embarrassed the learned and amiable baron, as well as others, to the class of *belles lettres;* and the remaining twenty-eight to the class of *history*. The belles lettres of the Caledonian literati are the polite arts of the Prussian nobleman; and *their* history is *his* belles lettres.

287. Niewland, and others. I am obliged to name, without having had it in my power to refer to his writings; Niewland of Holland. He wrote, about the year 1791, a treatise "on the relative value and importance of the sciences," or "a comparative view of the value of the different branches of science."

In like manner, I can make no other reference to Professor Kant, to Thouen, and to Knaut.

288. Wronski. I am more fortunate in relation to the "*programme du cours de philosophie transcendantale*," of M. Hoëné Wronski, formerly a superior officer of artillery in the service of Russia; as authorized by his excellency the grand master of the imperial university.

It is interesting to perceive the transcendental philosophy thus rendered more familiar by the labours of M. Wronski; but the succinctness of the prospectus; the circumstance of the terminology not being yet received into the English language, and, in some instances, being insusceptible of translation; and the consciousness of my inadequacy to give a just representation of the system; forbid the attempt to impart its details. More in-

vestigation than can at present be spared, and more materials than are at present possessed, would be requisite, to explain the distinctions between, *didactic* and *characteristic anthropology*, *analytic* and *dialectic logic*, *esthetic* and *teleologic* judgment, *architectonic* and *canonic* knowledge, *algorithmy* and *geömetry*, *juridical* and *ethical legality*, *physical* and *hyperphysical well-being*, *esthetic causality* and *esthetic finality*, *transcendental determinative action* and *transcendental reflective action*, *passive* and *active cognition*, *analogous as to cognition* and *analogous as to volition*. Equal difficulties would attend an explanation of the import of the terms; *free causality*, *spontaneous causality*, *corporeity*, *negative criterion of knowledge*, *positive criterion of knowledge*, *hevristic*, *ideology*, *semiology*, *methodology*, *theoric functions*, *technic functions*, *pragmatic will*, *pedagogics*, *acroamatic philosophy*.

289. The French chemistry.

It will be improper to depart from Europe without referring to the important operation, effected in France, in relation to chemistry.

290. Its effects on society.

The operation effected in France, in relation to chemistry, has been attended with a greater increase of ethic force than even that of the distinguished naturalist of Sweden. Man is superior to other animals on this globe, among others, in these two particular respects; first, that the knowledge of any one individual may become the knowledge of the whole species; and, secondly, that the knowledge of the whole species, in one generation, however early, may be transferred to the whole species, in another generation, however

late, if the continuity of the race, or of its communications be not broken. Every increase of knowledge is, therefore, an increase of *power*. In proportion as the knowledge possessed by an individual is rendered general; in proportion as the knowledge of all preceding generations is placed in the possession of the existing one; in proportion as all grades of society are brought nearer to the same standard; so is the ethic force of the species increased. We are all witnesses of the force imparted by the botanical, and by the chemical, classification and nomenclature. To do for all the sciences what was, in those instances, done for two particular sciences, is the object of the present enterprize. If now done, or when hereafter done, it is presumed that it cannot fail to increase the ethic force of society, in free countries. These two examples of the Linnæan botany, and of the French chemistry, constitute the models on which the undertaking is constructed.

291. Causes of its efficiency. The French chemistry, as well as the Linnæan botany, may be resolved, with respect to the efficiency on human society, into these two simple operations; first, a more correct classification of the objects of the knowledge; and, secondly, the application of a nomenclature to that classification.

292. History of the chemical The French chemistry is remarkable on account of the process adopted for the introduction and establishment of the nomenclature; and the

nomenclature has, accordingly, been attended with remarkable success. nomenclature.

293. De Morveau

M. De Morveau was the person from whose particular mind the improvement in chemistry took origin; for from some particular mind, must take origin, every advance made in the general knowledge of the human species. He had been appointed to digest the chemical part of the methodic encyclopædia. In the exertion to execute an impracticable task, M. De Morveau discovered the defects of the science; and, at length, discovered the remedies of those defects. It was in the year 1782 that he commenced the divulgation of his important enterprize. Destined to speak in the name of the chemists of France, and in a national work, he did not dissemble from himself that it was not sufficient to create a language; that it was yet necessary that it should be adopted; and that it was only convention which could fix the value of terms. He was then persuaded that, before committing himself to the painful enterprize with which he was charged, it was necessary to sound the French chemists; to develope to their view the general principles which were to serve him as a guide; to present to them tables of the methodic nomenclature, which he proposed to adopt; and to obtain their direct, or, at least, their tacit consent. His memoir was then published; and he had the modesty to solicit not the *suffrages*, but the *objections*, of all those who cultivated chemistry. However near M. de Morveau had approached his aim, in the first attempt, he had not yet reached it. He was himself well

apprized that, in a science which is in a state of mobility, which marches with large steps towards perfection, in which new theories are raised; it was of an extreme difficulty to form a language, which might agree with different systems, and which might satisfy all opinions without exclusively adopting any. To strengthen himself on his march M. de Morveau was desirous of being supported by the counsels of the chemists of the French academy; and undertook, in the year 1787, a journey to Paris, with that design. He offered the sacrifice of his peculiar sentiments, and of his personal labours; and, in him, the love of literary property yielded to the love of science. In the conferences which were held the other gentlemen sought to become penetrated with the same spirit. They forgot that which had been already done, that which they had themselves done, to see only that which remained to do; and it was not until after having passed many times in review all the parts of chemistry, after having profoundly meditated on the metaphysics of languages, and on the relation of ideas to words, that they hazarded the formation of their plan. When formed it was exposed, in tables, during the time that was judged necessary, in the hall of the academy; in order that every person might become intimately acquainted with it, and that they might be enabled, in this manner, to gather counsel, and to perfectionate their labour, by discussion. They were conscious that they could not accomplish the different objects, which they had in view, without often wounding received usages, and without adopting denominations, which ap-

peared hard and barbarous, at the first moment; but they observed that the ear soon accustomed itself to new words, above all when they were found connected in a general and methodized system. The received terms were, in many instances, more hard, and more extraordinary, than the new ones; requiring both long practice, and strong memory, to recollect them. Many of them were at the same time both ridiculous and false. They regarded it as a duty to fulfil the last wish, expressed by the celebrated Bergman, in the declining period of his life, when he wrote to M. de Morveau; "*shew no favour to any improper de-*" *nomination. Those who know already will always* "*understand; those who do not yet know will un-*" *derstand the sooner.*" Such is the interesting and elegant account of the origin and progress of the chemical nomenclature, in France, by M. Lavoisier, in his memoir on the necessity of a reformation in the nomenclature of chemistry; read in a public assembly of the royal academy of sciences, at Paris, on the eighteenth day of April, 1787.

294. Imitated, as a model, in the present enterprize.

The manner of thus introducing and establishing a nomenclature was marked in every step with the most exact propriety; and forms a perfect model for imitation in every undertaking of this description. It has accordingly been endeavoured to be strictly and faithfully pursued in the conducting of the present enterprize; as far as diversity of circumstances would admit of similarity of action. A developement of that enterprize cannot, however, be permitted, without a

previous examination of the scientific systems, which have been formed, or devised, in America.

295. American systems.

The classification of human knowledge, and nomenclature of the sciences, made by Mr. Jefferson, of Virginia, was indeed the earliest after that of the reverend Dr. Johnson, of Connecticut; and yet, from very peculiar circumstances, will, in this review, be examined last. At the time of its formation, it was the act of an individual, the subject of a European monarch, and the community of which he was a member scarcely emerged from its embriotic and colonial stage. Now, it is the system of a nation; a great nation; a nation which has, successfully, fought the autocratic, and the andrapodistic wars; a free nation, in which that very individual, a free man, has honourably fulfilled the most dignified and awful office of free laws. The brilliant deed of 1776 had in truth been done; but the attention of an anxious world was yet suspended on the issue.

296. The Philadelphia library.

The illustrious Franklin, in laying the foundation of the Philadelphia library; now one of the most superb monuments of literature which decorates our globe; gave origin to the first division of the sciences, which, in America, succeeded that of the learned president of the institution which is at present Columbia college. Like that of Mr. Jefferson, it was founded on the ever to be respected labours of ultimately refined genius in Great Britain and in France; the systems of Lord Bacon, and of D'Alembert.

On the same principle adopted by the curators of the library of the writers to his majesty's signet, in Scotland; the directors of the library company of Philadelphia, at first, conceived that the most convenient classification of books was that of the knowledge which they contained. They, therefore, adhered to the general division of D'Alembert, distributing their invaluable volumes into the three great provinces of, the memory, the reason, and the imagination; under the denominations of, history, philosophy, and poetry. This arrangement was made in the year 1789. It comprized six distinct ramifications in the first province, twenty-two in the second, and three in the last; amounting in the whole to thirty-two, including the miscellaneous department.

Anterior to the year 1807, the library of Philadelphia had received two valuable accessions; for the first of which it was indebted to James Logan, of Stenton, in the county of Philadelphia, and his honourable legatees and relatives; and for the latter to the liberality of the reverend Samuel Preston, rector of Chevening, in the county of Kent, in Great Britain, whose expanded mind, like that of Bishop Berkely, entertained a prophetic view of the future consequence of the western hemisphere. In this interval, the public taste had vacillated from the principle of the *scientific;* like that of the society of advocates in Scotland; to that of the *alphabetic* arrangement, like that of the London library. In the subordinate departments, however, and the index, the former principle was retained; and the alphabetical reduction

on that principle, evolved principally by the judgment and ingenuity of William Rawle, esquire, counsellor at law, of Philadelphia, will claim an undisputed superiority, when contrasted against the alphabetic dictionaries of the methodic encyclopædia of France.

297. The American philosophical society.

The library of the American philosophical society of Philadelphia was arranged under twenty-six successive divisions; somewhat similar to the nineteen heads of the Dublin society, in 1807. The former institution has since devised a distribution of knowledge into classes.

298. The Charleston library.

The arrangement of the library of Charleston, in the state of South Carolina, notwithstanding its being succinct, is marked with no ordinary excellence.

299. Dr. Kemp.

At New-York the first division of the sciences which was publicly inculcated, after the revolution, was that of Dr. Kemp; professor of mathematics, and of natural philosophy, in Columbia college. It was founded on that of Dr. Beattie, of Scotland.

300. Dr. Miller.

The reverend Dr. Samuel Miller, the present professor of ecclesiastical history and church government in the theological seminary at Princeton; author of the retrospect, in which is so luminously deduced the intellectual progress of the eighteenth century; had formed a general system by which to conduct his inquiries. He has since imparted to the system which will be here deve-

loped, at the personal conferences with the president and professors of Princeton college, in February 1816, all the treasures of his candid and enlightened mind; and it is now honoured with both his, and their, support.

301. Dr. Mitchill.

Few individuals in the United States have been so actively, and so long engaged, in the service of American science; and few have so effectually contributed to its diffusion and advancement; as the learned Dr. Samuel L. Mitchill, the present professor of mineralogy in the college of physicians and surgeons, at New-York. In the thirteenth volume, of the Medical Repository, he has delineated a very important and extensive range of science. The system of this work obtained the honour of his friendship and approbation at the conferences, in that city, in January 1816.

302. The New-York philosophical society.

Immediately after the termination of the late war, between the United States of America and the united kingdom of Great Britain and Ireland, the New-York philosophical society was instituted. It judiciously selected, for its first president, Clinton; the pride of the Eboracensian Republic. The first volume of its transactions, already under the eye of the scientific world, is remarkable for the value of its contents; and contains a succinct general distribution of knowledge.

303. Mr. Rafinesque.

Mr. C. F. Rafinesque, member of the royal institute of natural sciences of Naples, and of se-

veral other learned societies in Europe and America, now a resident of the Columbian republic, published, originally, at Palermo, in Sicily, and has since explained in America, his "analysis of nature, or picture of the universe, and of organized bodies." It exhibits a most comprehensive collection of subjects in the departments to which it relates; and the nomenclature is adorned with a rich store of new and distinctive terms, principally of Grecian etymology.

304. The capitoline library.

The library of the capitol in the city of Washington; which was conflagrated in August 1814, by an exploit of the British arms, than which there are many others in history challenging a superior admiration; was arranged on a principle somewhat similar to those of Philadelphia, of London, and of Dublin; but was by far the most imperfect of any.

305. Mr. Jefferson.

The conflagration of the capitoline library was however the means of accelerating an event, of importance to the nation, and to science.

306. Collects the monuments of American history.

Mr. Jefferson, as early as the year 1778, had made very ample collections of such literary treasures as America then afforded. His provident mind had long observed how evanescent are the memorials of passing time; and had, earnestly, applied itself to the obviation of that calamity, in relation to American history. All the productions, imparting elucidation to the colonial, and to the revolutionary æras of our country, had been assiduously attended to; and carefully preserved. But

there remained a field of no less interest, and still more unexplored, of which the location and the opulence was in the oriental hemisphere; and to that quarter were subsequently directed the sedulous attention and persevering research of the statesman, the sage, and the patriot, of America. Representing the dignity of the new-born nation of the west, at the court of what was then the finest monarchy in Europe, Mr. Jefferson extended his comprehensive view over the whole of that quarter of the world; and collected every production, on the subject of America, which yet remained, and could be procured. These precious monuments of the human mind, already losing their interest in Europe, he transferred to where that interest was increasing; and, in the progression of time, would still more increase; the bosom of the rising occidental republic. As the materials of the immense library of Mr. Jefferson accumulated it became gradually more necessary to reduce them to order; and thus were his labours, incidentally, directed to a systematization of human knowledge itself, in the reduction and classification of those innumerable tomes in which it is at once contained and displayed.

307. Devises a system of popular education.

In another capacity, and for another object, Mr. Jefferson was called to make still another distribution. The general assembly of the commonwealth of Virginia, on the fifth day of November 1776, appointed him, with his compatriots Edmund Pendleton, and George Wythe, a committee for the revision of the laws of that republic; the inapplicability of which to the state

of things consequent on the revolution had become plainly apparent. This great task was completed on the eighteenth day of June 1779, and a republican code reported, in which one of the most important, after that for the establishment of religious freedom, was a law for the general diffusion of knowledge; and which contains a classification of the sciences. This extensive system of popular education, that precious object of republican anxiety, the indefatigable spirit of Mr. Jefferson has never abandoned; and, on arriving at Monticello, on the first day of May 1814, for the purpose of a personal conference on this enterprize, he was found actually engaged in giving vigour and efficacy to the scientific institutions of Albemarle.

308. His public character.

It is, in human society, the destiny of only few to effect great changes and revolutions, and to influence for a long period the train and succession of events; and the public labours and character of Mr. Jefferson will afford a rich topic, to the pen, which shall delight to groupe, of those few, the portion that may appertain to America. Of other statesmen it has been the frequent lot to commence a career of liberty and virtue, terminated by corruption and tyranny. Of Mr. Jefferson the course has been pure and consistent; and alike distinguished by a firm adherence to principle, by talents, and by integrity. His earliest love was that of political freedom; and, in relation to temporal affairs, it will be his last. No individual character, in the annals of time, has effected so much, for that object; and

for the cause of republican government. He enjoys a fame which kings may envy; and it will reach distant times, and remote countries. Rigorous antiquity would not allow a perfect glory, while a human arm might yet touch the fame, nor until the character was canonized by death; but the muse of history is standing ready, with a stylus of steel, and a page of adamant, to record his name amongst those rare and illustrious men;

"quos equus amavit
"Jupiter, atque ardens evexit ad æthera virtus."

309. Transfers his library to congress.

Mr. Jefferson had long been sensible that his literary collections ought, at some day, to become the property of the nation. He had made arrangements for that event, when his earthly concerns should be closed, but the destruction of the national library induced him to make the intervening sacrifice; and the congress of the United States have availed themselves of the valuable acquisition. His classification of the works accompanies them; and either already has been, or, no doubt, soon will be, published, under the authority of congress. Thus this distribution of human knowledge may, for the present, be considered, in some degree, as a national one.

310. Devises a classification of the sciences.

Books, it is observed by Mr. Jefferson, may be classed according to the faculties of the mind employed on them. These are, first, the memory, secondly, the reason, and thirdly, the imagination; which are applied, respectively, first, to history, secondly, to philosophy, and thirdly, to the fine arts.

311. History. History is divided into civil and natural. Civil history is either civil proper, or ecclesiastical. Civil history proper is ancient or modern. Ancient history forms the first department which is called a chapter, and numbered; the total of the specific departments or chapters amounting to forty-four. Modern history comprizes the three chapters of foreign, British, and American. Ecclesiastical history forms a single and entire chapter.

Natural history has three ramifications; physics, natural history proper, and the occupations of man. Physics comprize five chapters; natural philosophy, agriculture, chemistry, surgery, and medicine. Natural history proper relates either, to animals, to vegetables, or to minerals; affording the four chapters of, anatomy, zoölogy, botany, and mineralogy. The occupations of man form the fifteenth and last chapter of history, under the title of *technical arts*.

312. Philosophy. The second province, philosophy, is divided into moral and mathematical. Moral philosophy is separated into, ethics, and jurisprudence. Ethics comprize two chapters; those of, moral philosophy, and the law of nature and nations. Jurisprudence is either, religious, municipal, or œconomical. Religious jurisprudence occupies a single and entire chapter, under the title of religion. Municipal jurisprudence is divided into domestic and foreign. Domestic municipal jurisprudence comprizes five chapters; equity, common law, law merchant, law maritime, law ecclesiastical.

Foreign municipal jurisprudence forms a single chapter, under the title of foreign law. Œconomical jurisprudence comprizes the two chapters of, politics, and commerce; and closes the branch of moral philosophy.

Mathematical philosophy is divided into two parts; pure mathematical philosophy, and physico-mathematical philosophy. Arithmetic, and geömetry, compose the two chapters of the first. The several subjects of, mechanics, statics, dynamics, pneumatics, phonics, and optics, constitute a single chapter. Astronomy follows as another, succeeded by geögraphy; and closing the branch of mathematical philosophy.

313. The fine arts.

The fine arts, constituting the third and last province, amount to eight. These are; architecture, gardening, painting, sculpture, music, poetry, oratory, and criticism. Architecture forms a chapter; gardening, painting, and sculpture a second; and music a third. Poetry has ten divisions. Epic and romance are the first two, and occupy each a chapter. Pastorals, odes, elegies, the three which next succeed, are comprized in one chapter. Didactic poetry, tragedy, comedy, follow; and occupy each a chapter. The two last, dialogue and epistles, are contained in one chapter; and close the branch of poetry. Oratory comprizes, logic, rhetoric, and orations; which form a single chapter. Criticism has three parts, theory, bibliography, and languages, each constituting one chapter; and closing the province of the fine arts.

The last and forty-fourth specific department, or chapter, is extraneous of the provinces; consisting of authors who have written on various branches, under the title of *polygraphical*. The whole is represented in a neat and concinnous table.

314. Variations in the system.

This table was twice, by permission, copied; at Washington, November the thirtieth 1801, and at Monticello, May the nineteenth 1814. It contains some variations. In the first, politics and commerce are two distinct heads or chapters. In the second, they are but one. In the first, in the place of natural philosophy, stands cosmology. In the first, the fine arts are arranged, gardening, architecture, sculpture, painting; in the second, architecture, gardening, painting, sculpture. In the first, gardening, painting, sculpture, are distinct heads or chapters. In the second, those three form one. In the first, music is divided into theoretical and practical, and the latter into vocal and instrumental, making three chapters. In the second, music, as a general term, is one chapter. In the first, poetry is divided into narrative, dramatic, and didactic. The first includes epic, romance; the second tragedy, comedy, pastorals, odes, elegies, dialogue; the third satire, epigram, epistles. The whole number of specific departments or chapters, in the first, is forty-six. There is, in the first, a note, annexed to moral philosophy; remarking that *in classing a small library one may throw under this head books which attempt what may be called the natural history of the mind, or an analysis of its operations;* and that *the term or division of metaphysics is rejected, as*

meaning nothing, or something beyond our reach, or what should be called by some other name.

315. Comparison of the system of Mr. Jefferson with those of Lord Bacon and D'Alembert.

As this system is founded on that of D'Alembert, which is itself derived from Lord Bacon, it will be only necessary to advert to its deviations from the one, or the other, of those; or from both. It is distinguished from both in this particular. It brings out the subjects of human knowledge into forty-four or forty-six distinct heads, which may almost be termed sciences, counted and numbered, and ingeniously concatenated, with an English name for every subject, and that the most usual, and perfectly intelligible; though the boundaries of mechanics, statics, and dynamics, would appear obscure. There is but a single attempt at nomenclature, and that is not a happy one. The mechanic arts are distinguished from the fine arts, by the name of, *technical arts*. Whoever will undertake to contrast the table of Mr. Jefferson against *the emanation of the sciences*, of Lord Bacon; or the *systéme figuré des connoissances humaines*, of D'Alembert; will find a perfect chaos in the two latter, and a clear and lucid exhibition in the classification of Mr. Jefferson. Mr. Jefferson arranges civil history before natural; in which he deviates from Lord Bacon, and corresponds with D'Alembert; but arranges civil history before ecclesiastical; in which he differs from D'Alembert, and corresponds with Lord Bacon. His specification of civil history is much more luminous and clear than that of either D'Alembert, or Lord Bacon. Mr. Jefferson transfers the physics, of D'Alem-

bert, from his third branch of the second province, and places it in the second branch of the first province; deviating in this also from Lord Bacon. This, it is conceived, is a manifest deterioration. The position assigned by Lord Bacon is better than that given by Mr. Jefferson; and D'Alembert's alterations on Lord Bacon are manifest and indubitable improvements. The whole province of philosophy is altered by Mr. Jefferson. Lord Bacon and D'Alembert beautifully divided it, as relating to, God, man, and, nature. Mr. Jefferson divides it into moral and mathematical. Mathematical philosophy is now, it is believed, first introduced as a scientific denomination. D'Alembert had, very correctly, made mathematics the first branch of natural philosophy; preceding physics. Both adopt the branch physico-mathematics, or mixt mathematics; which, it is conceived, will always be productive of confusion. Mathematics constitute but an auxiliary or instrumental science; and, to whatever they may be applied, are, themselves, distinct.

316. Mr. Jefferson misplaces religion.

Moral philosophy is singularly divided, by Mr. Jefferson, into ethics and jurisprudence. Religion comes out to be nothing more than *a part of jurisprudence*, and is the commencement of that branch, while commerce is the termination of it; and, in strict language, it may be doubted if either the first or the last subject, if either religion or commerce, are parts of jurisprudence. Governments have, indeed, acted upon them; but both, and more particularly the first, have a substantial existence, entirely independent of the

incidental circumstance of their being acted upon by governments. The passage, by the legislature of Virginia, of Mr. Jefferson's immortal "act "for the establishment of religious freedom;" constitutes, it is believed, the first instance, in the history of the human race, of a government *formally disclaiming the right of interfering with religious sentiment.* Religion, therefore, even in this respect, that of being acted upon by governments, ceases; at least in our country, so far as the state and general governments leave it free, which they almost perfectly do; from forming any part of jurisprudence.

317. Farther remarks on the system of Mr. Jefferson.

It may be farther remarked of Mr. Jefferson's system, and which may be fully accounted for, from the circumstance of its being intended only for the arrangement of a library, and not directly as a classification of human knowledge; that many of the terms must include more than they would strictly import. Thus arithmetic must include algebra, logarithms, and fluxions; since they are not elsewhere mentioned. History must include biography, and antiquities; and the extensive department of voyages and travels. Chronology must be a part of some other science; and in the same manner meteorology, and some other subjects. They do not appear, nor is it easy to say where they are contained. There must be a reiteration in the chapter of natural philosophy, being the sixth, and those parts of the physico-mathematical sciences contained in the twenty-seventh; nor will a reference to the authors and works included in those chapters

tend to render their boundaries more definite; and it would have been far better that natural history proper should have preceded natural philosophy. The separation of agriculture and botany is unquestionably right; but that of gardening from agriculture, and its association with architecture and painting, agreeably to the views of Lord Kames, is more dubious. Romance, comedy, dialogue, epistles, are not necessarily poetry; and indeed it was observed by Mr. Jefferson *that poetry was hard to be defined.* An edition of the elements of Euclid, in the Arabic language, is classed under criticism; and it is remarked that *books in rare languages are classed under that head, not according to their subject matter, but philologically, as specimens of the language in which they are written.* Some of the chapters are very barren. The ninth, surgery, contains but seven works. Others are very fertile. The twenty-fourth, politics and commerce, contains a large proportion of the library.

318. Mr. Jefferson devises a second classification.

The second classification made by Mr. Jefferson is contained in the bill "for amending the constitution of the college of William and Mary;" which immediately follows that for the more general diffusion of knowledge.

319. Original establishment of the professorships of William

The original establishment of that seminary had been; one school of sacred theology, with two professorships, one for teaching the Hebrew language and expounding the holy scriptures, the other for explaining the common places of divinity and the controversies with heretics; one

other school for philosophy, with two professorships, one for the study of rhetoric, logic, and ethics, and the other of physics, metaphysics, and mathematics; one other school for the Latin and Greek languages; and one for the instruction of the Indians in grammar, arithmetic, and the principles of the Christian religion, founded on the private donation of the celebrated philosopher Boyle, of England; who also founded a lecture at St. Paul's, in defence of the gospel against unbelievers, without any regard to differences among Christians. and Mary college.

320. The reformation proposed by Mr. Jefferson.

The reformation proposed by Mr. Jefferson would have enlarged the professorships to eight. The first was one of ethics; including, moral philosophy, the law of nature, and the law of nations; and fine arts, including, sculpture, painting, gardening, music, architecture, poetry, oratory, and criticism. The second was a professorship of law and police, divided into municipal law and œconomical law; the first including, common law, equity, law merchant, law maritime, and law ecclesiastical; the second including, politics, and commerce. The second was a professorship of history civil and ecclesiastical; and the third of mathematics, divided into pure and mixed, the first including, arithmetic, and geömetry, and the second, mechanics, optics, acoustics, and astronomy. The fifth was a professorship of anatomy and medicine; and the sixth of natural philosophy and natural history. Natural philosophy included; chemistry, statics, hydrostatics, pneumatics, agriculture. Natural history included; zoölo-

gy, botany, and mineralogy. Of the two remaining professorships, the first was for the ancient, and the second for the modern languages. A provision was annexed for an Indian missionary.

321. Remarks on the second system.

On this second system the number of specific departments would come out nearly the same. The order is greatly altered. The fine arts are brought from the last branch and placed in the first, associated with ethics. History is taken from the first rank, and placed in the third, after law. Civil history is now entirely separated from natural; one being the third, and the other being in the sixth branch. Geögraphy is not named. Seven great classes would include all knowledge; ethics, jurisprudence, history, mathematics, medical science, philosophy, and languages. The *technical arts* do not appear; but a similar nomenclature is used, in the bill, "for the more general diffusion of knowledge." In the thirteenth section, vulgar and decimal fractions, and the extraction of the square and cube roots, are called, *the higher part of numerical arithmetic.* The necessity of founding a distinction in a tautologous expression shews the inadequacy of present language; and verifies the remark of Dr. Willich, on the indispensability of a nomenclature. The variation between the two systems is readily accounted for. They were for different objects; and it was not apprehended that the arrangement of a system of education need, by any means, to correspond with that of the books composing a library. In fact, neither of the systems was intended as a direct classification of all human

knowledge. As both books and education embrace a great proportion of knowledge, some assimilations will always be found in a classification of the objects of either.

322. Certain manuscript systems.

Two manuscript divisions of human knowledge, and classifications of science, are in my possession; one of them made by Mr. Jay, counsellor at law of New-York, and the other by the Abbe Mango, of Palermo, in the island of Sicily. The first of these was made at my request; and the second transmitted to gratify my wish of being acquainted with its principles, and of adding it to my collection.

323. Mr. Jay and Bishop Hobart sketch classifications.

To Mr. Jay, and to the right reverend Bishop Hobart; with whose criticisms I was honoured in full on the system which is just about to be proposed; I had stated, that one of the most effectual modes of attaining conviction was that of applying the mind to the construction of such a system for itself, and then subjecting the system thus produced to a comparison of that proposed to be explained. Both these gentlemen adopted that course, and the result was attended with a perfect conviction. Bishop Hobart withdrew his system, after the comparison had been made, on account of its having been very succinct; but Mr. Jay, obligingly, permitted me to retain his, and gave me leave, when I should arrive at a discussion of the various systems, either to notice it, or not, as I should deem most prudent and expedient, according to the best of my judgment, at the time I came to act, and to say what

I pleased respecting it. In pursuance of that liberal permission I have, now, re-examined the system of Mr. Jay, under those views; and it appears to me, as it is an entirely original system, as it possesses great merit, as it is known that it was hastily made, and that its author, with the right reverend Bishop Hobart, has publicly approved that against which it was made to come into comparison, and as the whole transaction exhibits in those gentlemen instances of the higher virtues of the human character, as rare as they are amiable; that more good than harm must attend the communication of it. I have, therefore, concluded on presenting it, in the same manner with the others. It appears to me to be attended with another useful effect. Considered as an original system, made, with a distinct view, on the existing state of knowledge; and taken in comparison with the systems of Dr. Scott, Dr. Barron, the society of advocates, of Baron Bielfeld, and of Mr. Jefferson, it seems to reduce to a demonstration the following position; *that the human mind has gone as far as it can go in arranging human knowledge, on the principles at present known, and that without new principles given or assumed it can advance no further.*

324. Importance of a correct classification sometimes not appreciated.

It is true that some minds have been met with, who do not perceive the importance of any division or classification whatever; and who can only believe it to be of consequence because so many distinguished men, in different countries, and in different ages, have attempted it. The utility of a correct division will be shewn, in the

fourth part of this discussion; which, it is probable, there will not be time to reach, at the present opportunity. It has been found that a great majority view the subject in an entirely different light, and regard the knowledge of man as now necessarily impeded, and almost stopped, by its own mass and accumulation; unless effectual means can be devised for reducing it into order and method.

325. The classification of Mr. Jay.

Mr. Jay divides all human knowledge into *sciences* and *arts*. The sciences teach man simply to *know*. The arts teach him to *act;* or to *employ the sciences* for the benefit of himself, and of others.

326. Sciences.

The sciences relate to *things;* to *events;* or to *duties*.

327. Physics.

The science of *things* may, in an enlarged sense of the word, be termed physics. Physics teach the knowledge of existences, spiritual or material. The knowledge of spiritual existences comprehends theology, which teaches the existence, nature, and attributes of the Deity; demonology, or the knowledge of other existences purely spiritual, and unconnected with matter; and nousology, or the knowledge of the human soul, its nature, modus operandi, et cætera. The knowledge of material existences is either of such as are inanimate or animated. The knowledge of existences inanimate comprehends the knowledge of the things themselves, or of their properties. In relation to the things themselves it

comprehends; astronomy, geögraphy, mineralogy, aërology, pyrology, hydrology, electricity, magnetism, botany. The knowledge of the properties of material things comprehends; arithmetic, or the knowledge of numbers; geömetry, or the knowledge of forms; chronology, or the knowledge of time; and chemistry, or the knowledge of those properties by which simple substances are formed into compounds. The knowledge of material things animated includes, zoölogy, and anatomy.

328. History. The knowledge of *events* includes; ecclesiastical history, civil history, voyages and travels, biography, epistles.

329. Religion and morals. The knowledge of *duties* embraces; natural religion, revealed religion, natural law; including moral philosophy, strictly so called, and the law of nations; and municipal law, embracing, the law of our own country, common law, statute law, law maritime, and so forth, and of other countries, as Roman, Hindoo, and so forth.

330. Arts. The *arts* are either *useful* or *agreeable.*

331. Useful arts. The useful arts comprehend; legislation or politics; language, including grammar, and criticism; oratory, including rhetoric, and logic; the art of war; agriculture; commerce; navigation; manufactures; mensuration; algebra; fluxions, including logarithms, et cætera; and writing, including printing, engraving, et cætera.

The agreeable arts include; the belles lettres, music, sculpture, painting, dancing, et cætera. 332. Agreeable arts.

This arrangement is original in its second ramification into, *things*, *events*, and *duties;* than which there has not been presented a better, by Aristotle, by Bacon, or by Locke. *Truths*, *duties*, *events;* would render it inimitable. 333. Remarks on the system of Mr. Jay.

Its primary division, or starting principle, similar to those of Mr. Chambers, Dr. Barron, and others; eliciting sciences on one side, and arts on another; leads to unnatural dissociations. Arithmetic is among the *sciences*. Algebra is, far off, among the *arts*. Government is an *art*, law is a *science*. Grammar, rhetoric, logic, music are *arts;* arithmetic, geömetry, astronomy, the remaining of the seven, are *sciences*. As, in Chambers, the scale begins with meteorology and ends with poetry; as, in Mr. Jefferson's systems, the first begins with ancient history and the second with moral philosophy, and both end with languages; so, it may be remarked, that among the useful arts, in the system of Mr. Jay, legislation and politics are the first, and writing, printing and engraving the last. The art of war stands oddly, between logic and agriculture. The position of chemistry comes out in a manner equally singular, between chronology and zoölogy; as in the system of Mr. Jefferson mathematics stand between commerce, and gardening or agriculture. The number of the specific departments, in the system of Mr. Jay, would come out to be about fifty-four. His system would, in part, cor-

respond with that of Baron Bielfeld, as regards the belles lettres; though called by the Baron the polite arts, and by Mr. Jay separated from grammar, and criticism, and rhetoric, and logic.

334. The Abbe Mango.

The manuscript system of the Abbe Mango bears the following title; *acrosofia, ossia genealogia delle scienze, di Vincenzo Mango, nobile Palermitano, ab. del SS. Salvatore, e di S. Nicone, o sia S. Vittore, dottore in sacra teologia, ed in ambe le leggi Dei, Marchesi di Casal Gerardi, Baroni Castellucci, &c.* It has for a motto,

"Singula quæque locum teneant sortita decenter;"

from the ars poetica of Horace, and is dated at Palermo, the twelfth day of February, 1816.

335. His system.

The Abbe Mango observes that wisdom is a production of an intelligent and an immortal spirit. He defines the attributes of a perfect, intelligent, and immortal spirit, the Supreme Deity, the alpha and the omega; of whom the Hebrew word Jehovah expresses the ineffable name. He divides knowledge into *didactic* and *didascalic;* the former objective and genealogical, the latter subjective, and accommodated to the intellect of a limited and finite spirit. Didactic science relates either to *divinity* or to *humanity. God* and *creation* form the two constituent parts of the first; *arts* and *society* those of the second. Every subject is regularly divided into two parts, and no more. Hence it has been called a *dichotomous* system; and, when by a close analysis of every generic term into two specific, becoming afterwards genera in turn, the dichotomy has been

extended to the production of twelve great classes of sciences, a nomenclature is constructed and applied, founded in Greek etymologies, and adapted to the Italian language. These terms would require considerable explanation to render them intelligible to an English eye. As a specimen of them the following may be given; previously observing that the system of the Abbe Mango, from the nature of its principles, is susceptible of interminable subdivision, and that as far as the subdivision is carried, in a handsome drawing, and representation of the system, which is under my eye, the specific departments, or heads of sciences, would come out to about sixty. Theosophy stands in the first position. In the column under it are found the terms; pneumatics, pansophy, pancratics, panagatics, archetypal science, original science. Ontognostics occupy the second position. In the column under it are found the terms; monadics, somatics, cosmology, etiology, teleology. Theoctistics occupy the third position. Under it are found; cosmognostics, physics, chimics, and mathematics. Anthropology occupies the fourth position. In the column under it are found; meropealogy, physiology, and psychology. In this manner the remaining eight classes follow.

336. Remarks on it.

The principle of a dichotomous division of the subjects of science is founded rather in an operation of the human mind than in nature. The dichotomy is conducted in this system with surprizing accuracy; and it is remarkable how seldom, in the result, subjects which are widely

separated in nature are brought together by the operation of an artificial principle. The system of the Abbe Mango evinces great thought, great ingenuity, and great perseverance; and when I reflect on the learning it displays, and on its entire originality, I cannot but be additionally grateful for the politeness, which, at his advanced years, he has manifested, in preparing it, and transmitting it to me, at so great a distance.

337. The Rev. Mr. Wylie sketches a classification.

In a conference, at Philadelphia, on the twenty-sixth day of March, 1816, I inquired of the reverend Samuel B. Wylie; of whose philological and general erudition the public are well apprized; if, previously to the developement of the system which was then about to be explained, he could state one which had obtained his approbation. His reply was that he had long sought for one, convinced of the extreme want of it, and that he had adopted the division of human knowledge into three great provinces or departments, under the denominations of *physics*, *metaphysics*, and *mathematics*. Of these he presented the subdivisions. He conceived the division to be perfect; the names unexceptionable; and the order and succession, as thus stated, to be exact. This is the same division which Lord Bacon states to have prevailed in the world anterior to his time. It is dubious whether it is not preferable to that of Mr. Locke. On the communication of the system, now about to be presented, and on fully comprehending it, the reverend Mr. Wylie; in the same manner as Dr. Hobart and Mr. Jay; gave it his decided support.

338. The enumeration of the systems completed.

This completes the enumeration of the systems; and thus have been carefully collected, and thus has it been endeavoured candidly to exhibit, all the divisions of human knowledge, and all the classifications of science, which have been formed, or attempted, either in ancient or in modern times, so far as information respecting them was attainable. I have deemed it a duty to give them all, without withholding one. Thus only can demonstration arise; and thus only could some of them have been preserved for future investigation. I hope it is a rich collection; and if, in gathering the materials, the dry and abstract nature of the subject has fatigued the mind, of which indeed an early monition was given, my sympathy has been uniformly attendant, and every care used to relieve its oppression. It is a necessary toil; but it is a task that need to be performed but once.

339. General inferences and views.

It would be improper to take leave of such a number of classifications, and of so many various attempts to reduce the vast mass of human knowledge into one correct and comprehensive system; without deducing some general inferences. These will present, in a condensed form, the results of the investigation, and will obviate the necessity of much detailed discussion and comparison, in the construction of an ultimate system; if any should be ever produced, which may prove generally satisfactory to the scientific world.

It may be inferred that no system is likely to

be correct and satisfactory which is not founded in the nature of things; and in the constitution of the human mind in relation to the material universe, and to the remainder of the mental or intellectual universe. The bold and ingenious attempt of Lord Bacon, founded on the faculties of the human mind, employed on those objects, has been tried by himself, and has been improved by the application of powerful and refined genius in France, and in America; and does not produce a classification universally satisfactory. On the contrary; after a labour of two centuries, the same system which obtained before Lord Bacon's day is, in the very last instance, regarded as still entitled to preference. It is, eventually, clearly perceived that all the faculties of the mind are requisite in all knowledge; and that if the enumeration of the mental faculties should be made ever so complete, yet that the objects of knowledge cannot be analysed in reference to them.

340. Systems founded on the nature of things.

The systems which have been under examination contain only five founded, purely, in the nature of things, as their primary principle. These are the system of Whang Ty, the Chinese emperor, that of Dr. Reid of Scotland, that of the ancient gnostics or platonizing Christians, that of the reverend Dr. Johnson of Connecticut, and that of the Abbe Mango of Sicily. Of these that of Dr. Johnson appears entitled to a decided preference. It combines all the advantages of the others, without any of their disadvantages.

In the train of Lord Bacon are appendant the systems of D'Alembert, Dr. Beattie, the Philadelphia library, Mr. Jefferson, Mr. Rawle, and Dr. Kemp; among which the precedence of Mr. Jefferson's will never be disputed. 341. On the faculties of the mind.

A third principle has been assumed, founded partly in the nature of things, and partly in the operation of the mind. It regards knowledge as speculative or practical. Dr. Johnson has subverted the foundation of all these systems; and has shewn the inseparability of *theory* from *practice*. If any knowledge could be imagined which is purely speculative, and unconnected with any practical result, it would be regarded as useless; and scarcely be permitted to retain the name of knowledge. All real practical knowledge is founded on some principles, and all theoretic knowledge leads to some practical result. No practice can be correct, which is founded on a false theory; and no theory can be founded in truth, which is false in practice. 342. Systems combining both principles.

Plato, Aristotle, and Mr. Locke, are those who have elicited this principle in the abstract. Of these Aristotle appears to be the most correct. His term *theoretica* is preferable to the physica of Mr. Locke; and his *poetica* combine the main beauty of the system of Lord Bacon, at the very same time that they obviate the main defect in that of Mr. Locke. It is not apparent that this division of Aristotle was known either to Lord Bacon or to Mr. Locke. It is found incidentally in the text of his discussion, and has

been little, if at all, noticed. Plato approached it without attaining it.

343. The division of sciences and arts.

The division into sciences and arts, or arts and sciences, is only the reappearance of the same principle in another, and in a less philosophical shape. The ancients made all the sciences *arts*. We retain their idea, in popular parlance, in the phrase, *liberal education*. A modern, Dr. Barron, makes the *theories of the arts* sciences. Thus this embarrassing distinction had become nearly evanescent.

The systems founded on this distinction are those of, Mr. Chambers, Dr. Turner, Dr. Barron, and Mr. Jay. I am not prepared to say which of these I should think the best; excepting that that of Mr. Chambers is less perfect than either of the remaining three.

344. Modifications of the two preceding.

As modifications, or as combinations of these two distinctions, which in their basis are characterized by identity, may be regarded; the system of the society of English literati, in the dictionary of arts and sciences, as well as those of Dr. Robertson, Dr. Adam Smith, Mr. Hume, Des Cartes, Lesclache, Le Grand, Baumeister, and, perhaps, Mr. Hobbes. I am not prepared to give any preference among these systems. Perhaps that of the Sieur de Lesclache possesses as much intrinsic merit as any other.

345. The categorists.

The categorists may be classed as a party in this scientific contestation. I do not profess my-

self adequate to so delicate an operation, as, among these, of assigning any preference; but the priority of this class I would give to Pythagoras. His categories were number and magnitude. Aristotle and others raised them to ten. Mr. Hume and others, reduced them to a more compendious catalogue; the whole of the ancient ones disappearing. Dr. Reid exhibits the editors of modern encyclopædias as multiplying them by the letters of the alphabet; and by all the words which may be arranged under those letters. In this class therefore may fall a great variety; Chambers, D'Alembert, the English society, the Encyclopædia Britannica, Dr. Verdier, Aristotle, the methodic encyclopædia, Mr. Rawle in part, Comenius, Bishop Wilkins. In this range the Encyclopædia Britannica possesses an unrivalled excellence.

346. The collocationists.

In the classification of scientific parties, may I be permitted, after the categorists, to name a certain party, the *collocationists?* They invert the process of the understanding. They attempt, not from any general principles, by an analytic power, to deduce the various arts and sciences in an orderly and a systematic form. They pursue a more practical course. They take them as they are in fact already deduced. Availing themselves of any received or intelligible names, they place together the subjects which have obvious natural affinities. They classify those subjects, disregarding the number of classes; and only careful that extremely unnatural and revolting associations should not be produced. They care nothing

about the concatenation of the classes. The *dernier resort*, of miscellanies, is left open.

Into somewhat of this principle may be resolved the several systems of; Baron Bielfeld, in part, the Parisian Lycéum, the Gallic Institute, the Caledonian society of advocates, the Britannic Royal Institution, Brunet. Among these, the society of the *writers to his majesty's signet* claim an uncontested precedence.

347. The desperati.

Some have abandoned the task of systematization as too intricate, as impracticable, and desperate. Into this party fall; D'Alembert, the editors of the Encyclopædia Britannica, those of the Encyclopædia Perthensis, Dr. Reid, in part, and perhaps the author of the domestic encyclopædia.

348. Partial systems.

Some have made but partial systems, embracing much of human knowledge, endeavouring of the mass to comprize a great portion in their particular departments; but not eliciting an equitable exhibition of the whole. Such are some systems of natural historians, of whom have been noticed Dr. Mitchill, and Mr. Rafinesque, and might have been Pliny, and Dr. Barton. Here also belong the elector of Baden and Mr. Stewart.

349. Systems imperfectly known.

Some systems are but partially known in America. Such are those of; Porphyrius, Leibnitz, Wolfius, Croker, De Bure, Verdier, La Harpe, Cambacerés, Niewland, Thouen, Knaut, Kant, Wronski, Castel; which, it is believed,

have been all mentioned, and those of Peter Lambecius, in his philosophica bibliotheca, and Gesner, of Zurich, in his pandects, which have been passed over.

350. Mystic systems.

Some systems are founded in mysticism. Such are those of Zoroaster, perhaps of Professor Kant, of the Egyptian hierarchy, of Pythagoras in part, perhaps of Wronski, which have been noticed; and, perhaps, also of Baron Swedenborgh, which has been pretermitted; and perhaps farther, in part, the Chinese system.

The American understanding will not tolerate mysticism. It is time; if the sentiment of the immortal Rush, of Pennsylvania, may be applied to another subject; *it is time to take science out of the hands of philosophers, and to place it in the hands of the people.*

351. Anomalous and fanciful systems.

Perhaps some systems may be anomalous. That of Sir William Jones might afford an example. Some are undoubtedly fanciful, as that of the nine muses; and perhaps, in part, of the Abbe Mango. Others may have been omitted in the general view; but it is presumed they will occasion no difficulties.

352. Close approximations.

A portion of justice yet remains to be rendered to Dr. Reid, and Dr. Barron; both of Scotland. Dr. Reid had made a very close approximation in his primary reduction of human knowledge to two general heads; according as it relates to *body*, or to *mind*. He was not apprized

that, *in their union*, a base was presented for a great range of sciences; which could not be classed under either separately. Dr. Barron discovers this principle, but makes no useful application of it. If Dr. Reid had discovered this principle, and had made the application of it, as far as it would go, the correction of the American Dr. Johnson would still have been requisite; and that system, though unknown to those gentlemen, was perfected before one of them was born, and before the other had become conscious of his capability to subserve the cause of virtue and of science. Nor can it by any means be foreseen how far the three united might have advanced, with the aid of Dr. Willich; until an actual nomenclature had been promulgated.

353. The system of this work.

It will now be in course to explain those divisions of human knowledge, and that classification and nomenclature of the sciences, which it was the main object of the present discussion to develope.

354. Preliminaries.

As useful preliminaries, and as the means of testing a perfect system, if such should ever be produced; or, in lieu of it, that which may be regarded as preferable; the laws to which a perfect, or, at least, a good system should conform, ought to be investigated and established.

355. The laws of a good system.

The following may perhaps be regarded as an enumeration of the laws by which a perfect or good system ought to be tested.

It ought, in the first place, to be *comprehensive*. Every part of human knowledge ought to be included. If any part, however small, should be omitted, it would so far be a proof of imperfection in the system. 356. The first law.

Secondly. *The analysis ought to be correct.* Not only ought the first general division to exhaust the subject, leaving nothing belonging to it omitted; but every subdivision should possess the same character. At the same time the separation should be easy and natural, not unnatural and forced. 357. The second law.

This is the most difficult law to be complied with. Many general divisions may be found; and, at the first view, many of them may appear equally good. But, in pursuing the subdivision, it is soon discovered that no natural and simple analysis can be applied. A forced and unnatural one is therefore substituted. There are few divisions where this defect does not appear, in the second or third steps. Mr. Locke and Dr. Reid do not attempt to go beyond the first step. The Chinese system takes a second step with great security. Even the third might be considered safe; if it could be known what is their real mathematical science. Dr. Johnson takes three steps, with great precision and certainty, and only falters on arriving at logic; shewing, at once, where the radical error of the system lies. Lord Bacon, on the contrary, abandons his own principle, in the very second step. In the first step, the objects of human knowledge are divided according to the

faculties of the mind. In the second step a new, unknown, and unexplained principle is introduced. One province is divided on the mere accidental acceptation of a word; the next on the nature of things; and the third, perhaps, in reference to application and object.

A strict compliance with this law is not only extremely difficult; but is, perhaps, even impossible, and beyond human power. It is a difficulty which, perhaps, goes far to prove that there can be but one correct and perfect system; and that when that shall be attained human knowledge is approaching its utmost boundary. A perfect division implies a perfect comprehension of the whole subject, at one view; and an imperfect comprehension of the subject necessarily implies an imperfect division, liable to be extended, contracted, or amended, as a future and more perfect knowledge of the subject shall be found to require. Hence the law, when knowledge is imperfect, may be intentionally violated, without censure. No part of human knowledge ought to be rejected, because it cannot be adapted to a system. A system, avowedly incorrect and excrescent, is, intrinsically, better than a defective system. The system of Lord Bacon, therefore, is, on the whole, better than that of Dr. Reid. The one is redundant, and the other deficient. Frivolous parts are indeed magnified in the one; but in the other, important parts, history, mathematics, religion, war, commerce, geögraphy, voyages and travels, natural history, are neglected.

It will, in the third place, be one criterion of a good system that subjects closely allied by nature should not by art be widely separated. Arithmetic should not be found in one province, and algebra at a great distance, in a province entirely distinct; of which there has been given an instance, in the sketch of, my invaluable friend, Mr. Jay. No task could be more delicate, in practice, than to draw the line, on one side of which, an art remains a *mechanical* art; and, on the other side of which, it becomes a *fine* art. Yet on this delicate distinction, in the system of Dr. Reid, does its position depend. If a mechanical art, it appertains to the province of *matter*. If a fine art, it is removed to an infinite distance; and is found in the province of *mind*. 358. The third law.

The converse of this rule must be regarded as a fourth law. Subjects which are widely separated, in nature, should not, forcibly, be brought together, by science. Lord Bacon violates this rule in bringing together civil history and natural history; of which the association is only in a word. D'Alembert and Mr. Jefferson violate this law in associating the fine arts, which relate to material objects; such as sculpture, gardening, architecture; and those which relate to the mind, as poetry, oratory, philology, and criticism. Linnæus violates this law in associating the horse, man, the bat, the monkey, and the whale. The scientific fact is important, and stamped with philosophical exactitude; but good sense, combined with genius, should have otherwise managed the fact, and have reduced the classifica- 359. The fourth law.

tion to a greater conformity with ordinary and popular apprehension.

360. The fifth law.

The precedence of elementary to concrescent subjects may be deemed a fifth law. The alphabetical characters claim a presentation before prosody or syntax. Grammar ought to precede philology; mathematics should be precedent to physics; chronology and geögraphy to history. To invert this order, in any instance, afflicts the mind. In both the systems of Mr. Jefferson, natural history is subsequent to natural philosophy. In the first system, mathematics are first subsequent to natural philosophy, and then regarded as in combination. In the second system, mathematics precede natural philosophy altogether. Lord Bacon violates this rule in relation to mathematics; but D'Alembert elegantly corrects the deviation.

361. The sixth law.

It is a sixth law, alike important and indispensable, that *the boundaries of the divisions should be definite*. If the divisions run into one another, and it becomes impracticable, or extremely difficult, to determine to what division a particular subject appertains, confusion must ensue. This has always been the main obstacle alleged in conversation. The right reverend Dr. White, bishop of the protestant episcopal church of Pennsylvania, was disposed to view it as insuperable. Mr. Du Ponceau, counsellor at law, of Philadelphia, contemplated it as infinitely formidable. Dr. Reid and D'Alembert both represent it, in express and formal discussion, as beyond

human power. Until the boundaries of the sciences can be defined it is in vain to expect a satisfactory systematization; but this difficulty has been probably too much magnified.

362. Two corollaries from the sixth law.

When this obstacle shall have been overcome, two laws will arise, which may be regarded as corollaries; and, of which, the one is the converse of the other.

Reiterations must be avoided. The same science must not appear in two places. By the violation of the fourth law Lord Bacon involves the infraction of this corollary of the sixth. Almost the whole of his natural history must appear twice. Mr. Locke violates this law. All systems which separate theory from practice necessarily infract it.

The same subject must not be scattered and dissipated through a number of divisions; but should, somewhere, be found entire. All encyclopædias are examples of the violation of this corollary. Ornithology, as an instance, would first be scattered through the twenty-six letters of the alphabet; and then its objects more widely dissipated by intervening subjects. Every system founded on the categories would possess this defect; and that in an infinitely greater degree than in modern encyclopædias. There, the individual, when at last found, would be regarded as concrete; and be discussed and disposed of. The categories would subdivide even those individuals; and, by multiplicity of distribution and

reference of the parts, effectually, prevent a knowledge of the whole from being ever obtained. In this consists the radical and incurable defect of encyclopædial and categorical systems of all human knowledge.

363. The seventh law.

It will be found no small recommendation to a good system, if it even should not be exacted by a previous law, that the same natural priority which some subjects in the different branches claim to others; as of arithmetic to algebra, and of both to geömetry, and of these again to physics; should not only characterize the several parts, but, if possible, should also characterize the system, as a whole. This would peculiarly adapt it to education. The auxiliary parts of knowledge would be attained before the principal. The mind would travel easily and rapidly along. The end of one science would be but the obvious beginning of another; and, when the last has been attained, the whole will appear as a unit. All the sciences combined will make but *one universal science;* of which not even a link could be displaced. The mind, having begun to acquire knowledge, would never rest satisfied, short of the whole. Nor would the means be absent; or, in application, difficult or tedious; of investing it with the whole. New ranks of mankind would be elevated to the possession of science; the pride of philosophy would be reduced; and the whole mass of society would be improved, from both its extremes; not only in relation to its virtue, but also in relation to its piety. That partial knowledge, which sometimes

is considered as producing a divergence of the mind from the sense of Deity, when converted into that which is full and complete, fixes its belief on a foundation which can never afterwards be shaken; or so much as assailed.

364. The requisites of the nomenclature.

In the construction of a system, which shall render obedience to these laws; a correct and appropriate nomenclature is an instrument, as useful, as it will be found indispensable. When the divisions of any subject are first made clear, the nomenclature becomes easy to be recollected; and, even the more so, from the novelty, and, of course, the peculiar and unambiguous application of the terms. Strength, and grace, and ease, and euphony; ought, if possible, to characterize it. Difficult, barbarous, and uncouth, terms should be rejected. The nomenclature is the dress of the divisions, and should be adapted to its subject and season. Never so light and thin as to display the nude anatomy, never so thick and cumbrous as to conceal and deform the symmetry of the limb, and the elegance of the shape; in systematic nomenclature, and particularly in a nomenclature devised for universal science, the terms should be strong but flexible; one clothed with body and with substance, and the other not refusing ornament and decoration; this the warm garment of a northern sky, and that a purfled tissue, glittering in the summer-beam.

365. The last law.

As a ninth and last law, or as the corollary of the eighth, and as aiding alike in the analysis, and in the nomenclature, *the fault of interminable*

subdivision ought to be avoided. It is an oppressive tax on the memory; and, so far from promoting clearness, renders *confusion more confounded.* No more convincing proof need be adduced than the syllogisms of Aristotle. No person, now living, understands them; nor will any, hereafter to come, understand them. It is the unfortunate effect of subdivision, too minutely prosecuted, to darken what was intended to be illustrated.

366. The system of this work commenced.

The divisions of human knowledge, and the classification and nomenclature of the sciences, which it was the original and principal design of this work to develope, may, therefore, now, be fairly presented.

367. The three bases of all human knowledge.

All human knowledge must have relation either to *matter*, or to *matter in union with mind*, or to *mind.*

368. A metaphysical difficulty obviated.

To those who are much conversant with metaphysical disquisitions a difficulty might here appear, on the very threshold of the subject, to arise; as to the distinction between matter and mind.

The common sense of mankind, however, always has been, and is now, and always will be, fully competent to make this distinction, without a possibility of erring.

369. Difference,

In this, as in many other instances, our knowledge is founded in contrast; and, frequently, can

never advance farther than the perception of the contrast.

or contrast, frequently a source of knowledge.

Thus if, in nature, there were no such thing as, *night;* language would, probably, want a term to signify, *day.* As soon as day and night have been perceived to exist, though it might not be possible to define them, to comprehend their nature, or to explain their causes; though, in one age, different definitions, explanations, and causes might be assigned, and even believed, from those which are assigned or believed in another; yet the human mind, while sound, and all its faculties unimpaired, can never mistake the import of the terms.

In the same manner, if there were, in nature, no such thing as, *winter;* we should probably have no term, in language, to denote, *summer.* As those seasons exist in nature, in whatever their intrinsic difference may either really consist, or in whatever it may be supposed to consist; whatever may be the definitions, the causes, the explanations, or the names; true or false, proper or improper; which may, at any time, prevail; the human understanding, soundly constituted, and in the full possession of all its faculties unimpaired, can never err in recognizing the distinction between them.

With no other faculties than those with which the intellect of man is endowed, the existence, or possibility, of vice, is absolutely necessary to impart the idea of virtue; and the actual existence

of evil to produce a conception of good. In whatever their difference may consist, whatever may be their denominations, and even however dubious may sometimes be their limits and boundaries; they are distinctions which the mind recognizes without difficulty.

370. Difference of matter and mind determined by common sense.

Thus, in the general distinction between matter and mind, the intellect of man operates with intuitive certainty; and without a possibility of mistake. Wherever existence is perceived, without the evidences of thought, it recognizes matter; and wherever are perceived the evidences of thought it recognizes mind. Being, incogitative and insentient, is matter; and mind is cogitative and sentient being.

371. Precludes no philosophical investigations.

Nor does the view, which the common sense of mankind takes of matter and mind, preclude any philosophical and recondite investigations, or speculations, about either. It may still be contended that matter is ideal, or that mind is material, or doubted whether either the one or the other have a philosophical existence; without producing the least confusion in human thought, or in human action. The utmost latitude may be given to the enquiries of the philosopher, and of the metaphysician; and it need not be feared that either of them will differ, in this particular, from the man of plain common sense. As a thousand varieties of sentiment might be entertained about day and night, without producing the least confusion in the distinction between them, or the smallest diversity of human action in rela-

tion to them; so a million of theories may be indulged respecting matter and mind, and as little confusion, and as little diversity of action, produced. The faculties of man cannot be deceived, though his reason may; and the points, on which the philosopher and the man of ordinary common sense may differ, are not as important, nor as numerous, as those on which the constitution of their common nature compels them to agree.

So the coexistence of matter and mind, in the same being, may be clearly perceived; with still as little knowledge of matter, or of mind, or of the nature and manner of their connection.

372. Properties of this division.

This division obeys the first law. It is comprehensive. Nothing which we can by any possibility know is omitted. Within one or the other of these provinces must every thing fall on which a human thought can be actually exercised. Whether existences other than these are not possible, and however numerous such existences might be, the faculties of man are not competent to attain the cognizance of them; and, in our present form of existence, these are the impassable boundaries of our universe.

In the order of the subjects obedience is paid to the fifth and seventh laws. The material universe first engages our attention. The mind; rich in its own consciousness, and happy in the exercise of its faculties; is last in directing their force upon itself. Sensation is an operation less com-

plex and refined than reflection, and by the former are the resources of the latter supplied.

From inanimate and insentient matter the transition is immediate and natural to its combination, or coexistence, with thought; as it is presented in animated beings.

Having thus obtained the first observation of mind, by an easy abstraction, the latter is regarded in a separate state; and becomes eventually by far the most interesting subject of contemplation. To invert this succession would be to invert the order of nature, and to proceed in a direction contrary to the necessary progression of the human intellect.

These several departments, matter, matter in union with mind, and mind, comprehend every thing with which the human understanding is conversant; and constitute the three great provinces of the intellectual world. Such also, among themselves, is the order and the succession of those intellectual provinces.

373. The first province.

The division of the first province is then next to be pursued, that which has relation to matter.

374. Matter regarded in two relations.

There are two entirely distinct points of view in which matter must necessarily be regarded by the intellect of man.

375. Abstrac-

The first of these is, as affording the origin, on its presentation to the observation of the hu-

man mind, to *certain abstractions in the mind itself.* tions from matter.

In order to obtain a perfect and a clear view of the abstractions, to which the presentation of matter to the observation of the mind of man gives origin, in the mind itself, it will be requisite to adopt a process; which, though rarely necessary, is, at the same time, by no means attended with difficulty. The attention, already familiarized to material objects, must be directed to a point of time when those objects may be supposed to have first come under its cognizance.

Instead, therefore, of arriving at an acquaintance with material objects, in the ordinary course of nature; let a human being be imagined to be instantaneously created. Let all his faculties and powers be presumed to be perfect, such as they might be supposed at the middle period of human life, assuming for an example the age of thirty-five; with this exception alone, *that those faculties and powers have not yet been actually exercised upon material objects.*

To such a being, thus instantaneously coming into existence, with all the human faculties in their full perfection, but yet unacquainted with the objects of the material universe; let now material objects be presented.

The first abstraction made by the mind from these objects is that of, *number.* The idea of num- 376. Number.

ber never could have entered into a human mind but by the actual presentation of material objects to its observation. It is an abstraction instantaneously made, on the presentation of more than one material object to the observation of the mind. The idea of number is a necessary concomitant on the perception of unity, or individuality; and it is as impossible for the mind to reject the abstraction, as it is for it to reject the perception of the objects which give rise to that abstraction, when they are presented to its observation. It is not to be presumed that the anthropic intellect would become, otherwise than by gradual exercise, conscious of its immense power even over number; but certain it is that the abstract idea of number is thus originally, thus immediately, and thus necessarily produced.

377. Its indestructibility. The idea of number, once obtained, is indestructible. Though the material objects by which the idea was produced should be annihilated, yet the idea of number still remains in the mind; and while its faculties are preserved perfect and sound can never be destroyed.

378. Its infinitude. The idea of number, once obtained, is also, under the power of the anthropic intellect, necessarily infinite. The utmost strength of mind, the ultimate exertion of thought, is not competent to conceive or imagine a number so great but that unity may be added to it; and still, however vast the accumulation, it ever refuses to be insusceptible of the same condition.

379. The criterion of rationality.

The power of enumeration is accordingly regarded in man as the standard of rationality. The human being, whose intellectual faculties are inadequate to the task of enumeration, is deemed to fall below that standard; and is pronounced idiotic. In the English law, he who cannot count ten is not an intelligent and responsible being. The difference between the intellectual power of man, and the intellectual power of brutes, is, perhaps, in no particular so strongly marked as in relation to number. We may have reason to believe, as an instance, that the intellect of an animal inferior to man may be capable of attaining the idea of two; but we shall be at a loss for evidences of its being capable of attaining such an idea as that of eleven. The human intellect, on the contrary, at its very entrance upon knowledge, seems already to disdain limitations; and to claim acquaintance with infinitude.

380. The base of science.

Thus may the idea of number be considered as the base of all human science. It is that indispensable foundation, which being removed, the whole superstructure falls. The range of the human intellect would be as contracted as that of the intellect of other animals, if its powers, in relation to number, were characterized by similar imbecility; and restricted to limits equally narrow.

In the progress of this discussion the relationship of language to all other human knowledge will be carefully investigated; and its posi-

tion, it is hoped, satisfactorily ascertained. For the present, number must be considered as the base of all science, and more important than language itself.

381. The first practical question.

Having thus deduced one particular and definite base of knowledge, it will now become necessary to meet and to determine a question, which not only occurs on the very threshold of the investigation; but which will also constantly recur at every stage of the progress.

Into how many sciences shall the subject of number be divided? Shall it form one science, or shall it form more than one science? And, if it be determined that it shall form more than one, how many sciences shall it form?

382. The second.

A second question, of equal practical importance, will immediately arise. How shall a subject, which constitutes the base of a single and particular science, be distinguished from another subject, which constitutes the base of a collection or range of sciences?

Thus matter appears to constitute the base of a great collection of sciences; and the abstractions, to which the presentation of material objects to the observation of the human mind gives rise in the mind itself, appear to constitute the base of another subordinate collection of sciences; and number appears to be one of those abstractions, which are created in the mind itself by the presentation of material objects to its ob-

servation; and whether number should constitute the base of a particular science, or become itself, in turn, the base of a collection of sciences, how is the eventual specific and individual science to be distinguished? Does not the principle of an infinite division, and subdivision, appear? If animals should constitute the subject of a great general science; do not particular classes of animals, as birds, or fishes, constitute the subjects, again, of particular sciences? And may not particular kinds of animals; the horse, for instance, or bees; constitute the respective subjects, again, of other particular sciences? Where is the limit to be drawn between general and particular sciences, and by what means are the one to be distinguished from the other? How is the genus to be distinguished from the species? And is it not indispensably necessary that a scientific unit should be established? How, otherwise, are the parts of a science to be distinguished from the whole; or a specific and particular science from those great departments, which comprehend an extensive range and collection of sciences?

Until these interrogations shall be rendered susceptible of a satisfactory response, not a single step can be made in the classification and nomenclature of the sciences.

383. Cause of the existing confu-

The want of this distinction is one principal cause of the great confusion of the sciences. Let only this incipient difficulty be overcome, and an essential advance is already made.

sion of the sciences.

A few experiments are alone requisite to exhibit, in the most glaring light, the existing confusion, in science, in this respect.

384. Confusion of natural philosophy.

Let the enquiry be made, and even of those most conversant with the subject; is natural philosophy a single science, or does it comprehend a great range and collection of sciences? If it is not a single science, and comprehends a collection of sciences; what are those sciences of which it is composed, how many are they, and what are their names? To the first enquiry the person undertaking to answer would probably be obliged to render an ambiguous response. In certain respects, he would say, and under certain views, natural philosophy is but one single science; but, in certain other respects, and under certain other views, natural philosophy comprehends many single and particular sciences. Acoustics is a science. Optics is a science. Hydrostatics is a science; and so are a number of others. If it should be asked, is catoptrics, is dioptrics, a science? it is not readily conceived what answer would be returned. If it should be asked, is natural philosophy itself a part of some other still more general science? it is presumed that no answer could be given. The person of whom the enquiry should be made could, probably, by no means, return an answer in the affirmative; and would, perhaps, be equally far from giving an answer in the negative. After having also enumerated all the sciences, which he might imagine natural philosophy to include,

as subordinate parts, he would remain uncertain, whether those subordinate sciences included the whole of it; or whether there might not be, still, some portions of natural philosophy, not included in any of the parts enumerated. In this indefinite and confused situation stands, at this day, even a department of knowledge which has been so much cultivated, as that of natural philosophy.

385. Confusion of medicine.

In like manner, let the experiment be repeated on some other branch of knowledge. Let it be enquired, is medicine a single science, or, does it embrace a collection of sciences? and, if so, what are those sciences; and what are their number, their order, and their names? It is presumed that the result would be in every essential respect, the same. Medicine would, in some respects, appear to be but one science; and, in other respects, it would be regarded as comprehending a number of sciences. But the exact number, nature, order, and name, of the particular sciences, which are assumed as parts and branches of medical science; would, probably, by no two persons, in the present situation of that department, be exhibited in the same manner.

386. Of belles lettres, ethics, metaphysics, war, history.

If the enquiry be prosecuted in relation to the belles lettres, we have already seen what a strange diversity of sentiment would be presented. Would ethics open any better prospects? Would the metaphysical department? What would be said in relation to military, and to historical knowledge?

387. Of mathematics.

Even mathematics, which have been so much investigated, have never been arranged. The mathematician would be as much embarrassed, as any of the others who have been appealed to, in rendering a satisfactory answer to scientific enquiries, which could, by no means be, justly, deemed impertinent. Is your science one science, or is it many? If many, what are their nature, their number, their order, their names, their relations? Is trigonometry a science, or is it a part of the science of geömetry? Is the higher geömetry a science by itself, or is it part of another science?

388. Of natural history.

Natural history, no less than the other departments, would be exposed to ambiguities and difficulties; though, in this department of knowledge, the nearest and most scientific approximations have been made to systematization. Mineralogy, botany, zoölogy, are definite and elegant terms; but the natural historian would hesitate in answering that they make the whole of his science. Of zoölogy again, parts have obtained definite names, and are almost considered as specific and particular sciences, such as ornithology, ichthyology, and entomology; while others, of equal importance, have not been equally favoured.

389. The confusion increasing.

Thus it is evident that the existing confusion is great, but a more serious misfortune remains. Proceeding, on the present principles, it must infinitely increase. As knowledge advances the sciences must, on one side, be referred to three, or four, or five, or six, ambiguous and unsatisfac-

tory general heads; or, on the other, extended to some thousand particular and specific sciences, of which the very names would be a burthen. At length it must stop; not that the intellect of the human species is absolutely incapable of any farther progression, but merely because the mass and accumulation have become so great as to be perfectly unmanageable. This is nearly its state in our great modern encyclopædias.

390. The remedy.

It has appeared to me that all this confusion between the generic and the specific sciences might be avoided by a very simple process. It is that of distinguishing the specific from the generic science by a difference of termination, in the name. If a particular termination should be selected, which, when combined with some radical word, should always indicate the name of a specific and individual science; the mind would no longer be at a loss to distinguish a single science from a collection of sciences. Such a question as whether trigonometry is a science, or part of the science of geömetry, or as whether ichthyology is a science, or part of the science of zoölogy, could never afterwards arise; because the very terms, by which the subjects were designated, would, in themselves, contain the answer to the inquiry.

391. The specific termination.

This leads to the developement of the first principle on which the nomenclature, attached to the present enterprize, is constructed. It is that of distinguishing a particular and individual sci-

ence, not only, on the one side, from a great general science, or a great range or collection of sciences; but also, on the other, from the several parts, subdivisions, and ramifications of a particular and individual science, by a special termination; appropriated, in the nomenclature, to that exclusive object. Thus the scientific unit is established. Thus both to the eye, and to the ear, a single word, not only names a science; but determines, with absolute precision, that it is not a collection of particular sciences, and that it is not a part of a particular science. This termination is called *the specific termination.*

392. Its conditions.

Two conditions, only, are indispensably requisite in the specific termination; and these are, *brevity* and *euphony*.

But a third condition might also be required, as a matter of expediency; that of *catholicism*, or *universality*, in relation to alphabetic languages.

This advantage might have been attained both in the Linnæan nomenclature, and in that of the new chemistry; but it has been neglected in both. The first is adapted to the construction of the Latin language, and the second to that of the French. The radical terms are, indeed, in both instances, almost altogether selected from the ancient languages; and, in relation to the botanical and the chemical nomenclature, principally, from the Greek language. But Linnæus had no other idea of his terms than that they were Latin words, and the terms of the chemi-

cal nomenclature were regarded as French words; though indeed susceptible of translation into the Latin language, and into other languages. It would, it is conceived, be a great advantage, in the future construction of scientific nomenclatures, if the terms should, from the beginning, be regarded as invariable; and as insusceptible of translation. The English language would yield to this rule, without the smallest difficulty. The Italian language would admit it, with ease. The German language would not refuse it. The principal difficulty, but that it is presumed not insuperable, would be found in the French language. It is sufficient, at present, to observe that the terms of this nomenclature are not designed as words of any particular language; but as words admissible into all languages, invariable, and insusceptible of translation. It is obvious that neither the Linnæan nor the chemical terms have been constructed with this view. In the zoölogical department of the former, there can be no question. How the terms of the botanical nomenclature are managed, in the French language, I am not at present aware. They are susceptible of appearance in the English language without variation; but this is not the case with respect to the terms of the French chemistry. These observations are intended, for the present, to be applied to substantives only; and do not refer to adjectives, nor to colloquial terms as contrasted with technical. There may be difficulties, in the subject, of which I am not at present aware, and which, when they appear, must, if insupera-

ble, be yielded to; but I think it useful, in the present stage of the investigation, to elicit clearly and distinctly the sentiment; that it is possible, in the construction of every future scientific nomenclature, to adapt the substantive technical terms to the vernacular languages, universally, without contemplating any variation of them, or any translation of them, as inevitably necessary in the particular languages.

It will be of advantage also, in the establishment of the specific termination; and will aid in imparting to it distinctness and force; that it should be monosyllabic. Cumbrous and unwieldy words are a great deformity in any nomenclature; and it will tend to obviate the multiplication of these, when terminations become necessary to be attached to every term, that the latter should be as brief as possible.

393. The termination selected.

All these views and considerations have had their weight in the selection, which has been made, of the specific termination.

The specific termination which has been selected is, *ia*. It denotes, whenever it appears, in its distinct and intrinsic character, in combination with any radical word or words, that the term signifies a particular and individual science; and not a great range or collection of particular sciences, on the one hand; or, on the other, any subordinate ramifications, or sections, of a particular science.

Some of the reasons which, in making the selection, have operated in favour of this termination will be stated.

394. Reasons of the selection.

It is that termination which, in the ancient languages, and both in the Greek and in the Latin language, but more particularly in the latter, was emblematic of; what will always possess a powerful charm on the human mind; *female personification.* Thus many of the Roman names of persons assumed that termination, when converted from the masculine gender into the feminine. Thus Æmilius became Æmilia, Cornelius Cornelia, Virginius Virginia, Portius Portia. In like manner most names of countries assumed that termination. Reciting the principal countries of Europe, commencing at the southern extremity of the continent, the following may be enumerated; Lusitania, Hispania, Italia, Gallia, Britannia, Hibernia, Caledonia, Germania, Scandinavia. It has become, in modern languages, and particularly in the English language, a poetic termination; and thus our own country has obtained a name, originally poetic, in conformity with the others, that of Columbia. It appears to combine all the requisite conditions, in a superlative degree. From its reception into the ancient Greek and Latin languages, and from its estimation in modern poetry, it is endowed, in a higher degree than any other, with the quality of universality; and it is, at the same time, possessed of both the other requisites, brevity and euphony.

395. Determination of the first practical question.

This, therefore, is the specific termination, and having settled this apparently minute, but in reality important and indispensable preliminary, we may now revert to the original question; shall the subject of number constitute one specific science, or more than one? and if more than one, how many? and what shall be the name or names respectively? Whatever the latter may be, it appears, by the preceding investigation, that the termination at least is fixed; and is now regarded as invariable.

In determining the question whether the subject of number shall constitute the base of one or of more specific sciences, aid may be derived from referring to the existing state of science, in this particular. Four terms will be found, in modern science, having relation to number, as the base of particular departments of knowledge. These are; *arithmetic*, *algebra*, *logarithms*, and *fluxions*. Are these then all separate sciences? or what number of specific sciences ought they to form?

396. Logarithms.

If a series of numbers be taken, increasing by a common difference; or as it is, by a slight impropriety of language expressed, in arithmetical progression; and another series of numbers be taken, increasing by a common multiplier, or as it is, by a more gross impropriety of language expressed, in geömetrical progression; any number in the upper rank, added to any other number, in the same rank, will express another

number in the same rank, under which will be found, in the lower rank, the product, formed by the multiplication, into one another, of the two numbers in the lower rank, immediately under the first two in the upper. The principle therefore of logarithms affords a process by which the more tedious and laborious operations of multiplication and division may be resolved into the more facile and simple operations of addition and subtraction; and by which similar facilities may be afforded in the extraction of roots, and in involution. Logarithms are, therefore, in reality, a part of arithmetic, and merely a simplification of some of its more tedious operations; and, so far as regards what are termed natural numbers, the explanation of the principle on which they are founded ought to enter into, and constitute a part of arithmetic.

397. Fluxions.

In like manner, fluxions are, in reality, a part of algebra. By the invention of some new principles in the notation, questions involving calculations, of extreme delicacy, tediousness, and labour, are managed; and settled with a promptitude, and certainty, which would not have been imagined practicable.

Thus two of the terms which enter into modern science having relation to number, as the base of particular departments of knowledge, are disposed of, and two only remain; arithmetic and algebra. Are these remaining, one science, or are they two?

398. Arithmetic and algebra.

Where there are plain, and, perhaps, in some respects, permanent differences in the nature of certain portions of knowledge, in the characters and elementary principles on which they are explained, and even in the purposes and objects to which they are eventually applied; those differences, or some of them, ought to be recognized in a scientific classification. That difference appears to me to exist between arithmetic and algebra. Both have, what is termed, on the continent of Europe, an *algorithm;* but the algorithm is not the same. One of them is elementary in relation to the other. Arithmetic may be known without algebra; but algebra cannot be known without arithmetic. Arithmetic is applied to the ordinary purposes and business of life; and is, therefore, taught with a reference to those applications. Algebra, on the contrary, is applied to extraordinary and singular purposes, to those of science or philosophy; and is, therefore, also taught with a reference to those applications. On these accounts arithmetic and algebra are considered as constituting two distinct and specific sciences.

399. Two sciences established.

The question is, therefore, resolved, whether the subject of number shall be regarded as constituting the base of one particular and specific science, or of more than one; and, if of more than one, how many. It is determined that the subject of number shall constitute the base of two specific sciences; but the question yet remains, what shall be the names of those two sciences? respecting which only one condition has been as-

certained; that the names of both those sciences, whatever they may be, shall have one and the same termination.

400. Resources of names

In deciding on the names of the sciences, so many resources of radical terms have been presented, and such varieties of sentiment have been entertained; that it will be prudent not to form a precipitate determination.

401. Received names.

Some have been of opinion that the *radices* of the received names ought to be selected. It is a sufficient argument that they are received. Whatever impropriety might have originally attended their selection, yet, in this, as in many other instances, custom and fashion have imparted their sanction; and that sanction is quite enough.

402. The vernacular languages.

Some have entertained the sentiment, that whether received names are, or are not, universally adopted, the vernacular languages ought not, at least, to be entirely rejected. Many of their terms, in their view, are fully as forcible, as expressive, and as elegant, as those of the learned languages. Wherever they have been fairly permitted to come into competition their value has been at once recognized. Can the new chemistry boast of a better, a more elegant, a more expressive term, than *gas?* Does any learned language afford a term which can be advantageously substituted in the place of *steam?* The finest terms which have been manufactured by the ingenious fabricators of the new chemistry;

their *oxygen*, their *hydrogen*, their *azote;* will bear no comparison with these expressive and energetic vocables, the undisputed property of the vernacular tongues. There is a classical superstition in favour of the learned languages; but, like other superstitions, it is productive of injustice. Of this turn of thinking none has proved a more persevering and enlightened defender than the eloquent Ogilvie.

403. The Latin language.

Whatever may be the fate of the received names, whatever the destiny of the vernacular languages, some have thought that there can be no impropriety in extending the range of selection throughout the whole of the learned languages; or, at least, of admitting the Latin language to participate in the honour of supplying the materials of scientific nomenclature. The authority of example may be adduced in its favour. The chemical nomenclature admitted radices from the vernacular languages; and from the Latin language, as well as from the Greek. Linnæus adopted both the Latin and the Greek language, as occasion led. Any single language, it is urged, however copious, must, by continual demands, become at length exhausted. Of these sentiments have particularly been, Mr. Du Ponceau, counsellor at law, at Philadelphia; and Mr. Bleecker, counsellor at law, at New-York. They would prefer a scientific nomenclature admitting Latin and Greek radices promiscuously.

404. The Greek

Many, on the contrary, have entertained a different impression, respecting scientific nomen-

clature. If, say they, custom and fashion are admissible authorities; on the determination of a question of this description; it may be said to be already determined, by those very authorities, in favour of the Greek language. Whenever the necessity has become imperious for the introduction of new scientific terms, they have always been sought in that classical and opulent emporium. Of all the terms of which the cultivation of science has afforded the introduction into language, by far the majority, with respect to mere number, and by far the best, in respect to quality, have been derived from the Greek. What, in fact, in a general view, is the Latin language but a dialect of the Greek? Of that language, at least one third, may fairly be considered as Greek. Of modern languages, and particularly of those most applied to, and best adapted for, scientific investigation; a very considerable proportion is Greek. Of the English language, as used in America, perhaps at least one tenth may fairly be considered as Greek. If the terms of Greek derivation in the English language were supposed to be suddenly struck out of it, insuperable embarrassments would supervene, even in ordinary conversation. Not only scientific terms, but even those of most familiar usage; such as *practice*, *charity*, *theatre*, and hundreds of others, of which the origin is as little adverted to; our customary names of persons and of places, John, Peter, Philadelphia; are all derived from the same source. A nomenclature, therefore, founded on the sole basis of the Greek language, would be more

pure and classical than one admitting barbarous and corrupt terms. Such terms would not only be more classical and intrinsically elegant; but they afford an essential aid to the memory. Though *gas*, or *steam*, are, casually, terms, in a great measure, unexceptionable; yet what figure would such terms as *sourstuff*, or *blazestuff*, bear in competition with those of *oxygen* and of *phlogiston*. Where a Greek radix cannot be found some other resource must necessarily be sought; but in the original construction of a scientific nomenclature, in every instance in which the Greek language affords a radix, to that the preference ought to attach. Of this sentiment have been, Mr. Jefferson, Col. Randolph, the reverend Dr. Wilson, Mr. Jay, the reverend Mr. Wylie, the president and professors of Princeton college, the reverend Dr. Gray of Philadelphia; and by far the great majority of those gentlemen whom the opportunity has, hitherto, been presented of consulting on this subject.

405. adopted. It has therefore, eventually, been adopted as a law, in the construction of this nomenclature; that *every radical term shall be selected from the Greek language.*

The specific termination having thus been determined, and a particular source assigned for the selection of the radical terms with which it is to be combined, it remains to attach names, in compliance with these two preliminary conditions, to the two specific sciences which have

their common base in the first abstraction, made by the human mind on the presentation of material objects to its observation; that of number.

406. The name of the first science.

With respect to the first science there can be no room for hesitation. The Greek term, ἀριθμος, is selected for the radix. Striking off the termination found in the original, and which is useless in relation to the present object; and substituting the specific termination, which has been adopted for the construction of this nomenclature; the name becomes, *arithmia.*

It may be proper here to advert to the origin of the received name. The ancients called all the sciences *arts;* and the term *arithmetic*, though a substantive in the English, and in other modern languages, is an adjective in the original. The word *art* was always understood, and the expression in full was, ἡ τεχνη ἀριθμετικη, *the arithmetic art.* The same observation may be made with respect to a variety of other terms in modern language. The terms, rhetoric, logic, music, physic, stoic, peripatetic, and others; all substantives in modern language, were adjectives in the original, and were always used with a substantive either expressed or understood. The change therefore, in this instance, may be considered in no other light than as a necessary reformation; and a restoration of the name from that adjective state, which it had accidentally assumed, to that more substantial form, with which it ought, in strict scientific propriety, to have been originally invested.

It is deemed an essential advantage, in this primary step of the nomenclature, that a received radix can be adopted. The term, *arithmia*, approximates so closely to the term, *arithmetic;* that, by a natural association of ideas, it would in ordinary usage, both to the eye, and to the ear, suggest the same import. Wherever, therefore, this auxiliary support can be enlisted, without improper sacrifices, it is too important to be neglected.

407. Of the second. Perhaps it must be relinquished in the very next science. With respect to algebra we derive the name, as well as the science itself, from the Arabians. The first syllable of the name is the definite article; and the remainder of the word imports, it is believed, analysis. By substituting for the last letter the specific termination, the same term might readily be reduced into a conformity with the principles of the nomenclature. But an imperious law, which has already been submitted to; and of which the oppressiveness, even at this early stage of its operation, begins to appear; exacts the rejection of one of the received terms. The term of which a selection has been made for the appellation of this science is that of, *analysia.* It is, in another sense, the received term. Those writers who, in the uncultivated stages of the vernacular languages, made use of the Latin language for scientific discussions, appropriate to the science this name; or rather, in more literal phraseology, denominate algebra, *ars analytica*, the analytic art. Sir Isaac Newton calls it *universal arithmetic.* In a very re-

cent work, that of La Grange, under the title of *théorie des fonctions analytiques;* fluxions are denominated, *analytic functions.*

The term, *analysia*, is not free from some important objections. There are many other operations of the human understanding which are analytical, as well as those of algebra; and it would, therefore, seem unfair that algebraic operations should, as it were exclusively, usurp the name. The reverend Dr. Wilson, of Philadelphia, observed to me, that as an algebraic operation terminates in an equation, a Greek radix importing *equation*, *equalization*, *equality*, might afford an eligible basis for the name. I presented to him from the synonymic table, the nature and use of which will on a future occasion be elucidated, the term *isotetia.* On being called upon, however, to manifest a preference between the two terms of, *analysia*, and *isotetia;* he has rather attached the present superiority to the term, analysia. Such has uniformly been the case with the other scientific gentlemen, who have been consulted. There are reasons, which would fully account for this uniform preference of that term, at the present time; but circumstances render it improper to delay the discussion for the representation of them. It is sufficient to observe that the term *isotetia* is retained in the synonymic table, while the term *analysia* is presented in the table of nomenclature.

Two specific sciences are thus deduced, founded on the common base of number, with the 408. The generic

termination. names appropriated to them; the two sciences of, arithmia, and analysia. It remains to connect these two specific sciences, by a generic term, into one order; and this leads to a developement of the selection which has been made of *a generic termination.*

The generic termination which has been selected is, *ica.* It denotes, wherever it appears in combination with any radical word or words, that the term signifies a scientific order, class, or province, comprizing one, or more specific sciences.

The reasons which, in making the selection, have operated in favour of this termination, will be readily apprehended. It is in the Latin, and, in some measure, it may be said, in the Greek language, the termination of the adjective, in the nominative case, of the plural number, and in the neuter gender. It may, in fact, be said to be already received; for the English words, physics, ethics, mathematics, metaphysics, optics, dialectics, and a great variety of others, are obtained in this way. They are English plural substantives, without correlative singulars, derived from corresponding Greek adjectives. As the specific termination, in all cases, denotes a term in the singular number; so the generic termination, in all cases, denotes a term in the plural number. Like the specific terms, the generic terms are intended to be invariable; and insusceptible of translation. The English language receives them immediately, in their es-

tablished form; without the smallest difficulty. The Italian language would admit them with ease, and the German language would not refuse them. The principal difficulty, but that probably not insuperable; would be found in the French language. Either a specific, or a generic term, subjected to a reduction into analogous words, in any of the vernacular languages, experiences a sensible deterioration. It is, therefore, regarded as important, to preserve the term, as far as may be practicable, in any migrations into languages, in which science is cultivated; free from adulteration. The correlative adjectives, it is presumed, must be reduced to an analogy with the particular language; but it is not perceived that a variation in the substantives will be indispensable.

409. The first order.

The radix which has been selected for the appellation of the order comprizing the two specific sciences, having their common base in number, is the Greek adjective, αριθμετικος; and the name of the order thus becomes, *arithmetica.*

One order has thus been deduced, under the name of, arithmetica; embracing two specific sciences, under the names of, *arithmia*, and *analysia.*

The first abstraction, therefore, made in the human mind, on the presentation of material objects to its observation, is exhausted; in relation both to the general, and to the particular sciences, of which it is the base.

410. Space. The second abstraction made by the human mind, on the presentation of material objects to its observation, is that of *space*.

The idea of space never could have entered into a human mind, but by the actual presentation of material objects to its observation. It is an abstraction instantaneously made, on the presentation of more than one material object to the observation of the mind; or even of one, in two different places. The idea of space is a necessary concomitant, on the perception of different material objects, or of the same object in different places; and it is as impossible for the mind to reject the abstraction, as to reject the perception of the objects themselves on which the abstraction is founded, when presented to its observation. The abstract idea of space is thus originally, thus immediately, and thus necessarily produced.

411. Its indestructibility. The idea of space, like the idea of number, once obtained, is indestructible. Though the material objects by which the idea was produced should be annihilated, yet the idea of space still remains in the mind; and, while its faculties are preserved perfect and sound, can never be destroyed.

412. Its infinitude. The idea of space, once obtained, is also infinite. The utmost strength of mind, the ultimate exertions of intellect, are not competent to the conception of a space so great, but that another smaller space may be added to it; and,

however vast the accumulations of the imagination, they are no nearer an end at the termination of their progress, than at the commencement.

413. Reference to Lucretius.

The president of the United States of America, on an exposition of this division of knowledge and nomenclature of the sciences, on the tenth day of July 1814, referred me to an elegant passage in Lucretius, illustrating the infinitude of space. I have since examined the passage, and like many others in that poet, it presents a mode of reasoning which is absolutely unanswerable. If space be not supposed infinite; let a person be imagined to have advanced to its boundary, and to cast forward a spear. If the spear be resisted, and cannot pass; there is matter, which occupies space. If the spear pass, unresisted, there is space.

414. Geömetry.

Space is not the subject of science until defined by figure. Figure is *space with boundaries;* and presents the base of the science of geömetry.

The etymology of the term *geömetry* would limit its import to the mensuration of land; and it has therefore, from the earliest times, been lamented that the science, which has for its basis space defined by figure, should not possess a more appropriate name. Plato complains of the inadequacy of the term *geömetria*, but does not suggest a better. The Greeks do not appear to have had a good word even for space. The term, διαστημα, signifies more properly distance. I have

collected a number of terms, in the synonymic table, which might be adapted to signify geömetrical science; but I have not been able to select one, nor has any person, with whom I have consulted, been able to select one, to which a decided preference would be attached, over the received term. It is therefore retained. It is not a term, in itself, unexceptionable; but it is the best which can be procured.

The enquiry will then present itself, into how many specific sciences shall the subject of space defined by figure, or, in other words, geömetrical knowledge, be distributed?

It is remarkable that geömetrical science, which has been so much cultivated, has never been arranged; and yet it appears to me that it is susceptible of a clear division.

With every proper deference to the eventual, and definitive judgment, of the professed geömetrician, that division, which has appeared thus clear, will be submitted.

Geömetrical science is regarded under three aspects. The first of these is, in relation to *space defined by figure in the abstract.* The second is, in relation to *the application of number to space defined by figure.* The third is, in relation to *the application of algebra to geömetrical science.* Thus there would be three specific sciences, having their common base in space as defined by figure.

The first of these three geömetrical sciences would consist of the Euclidian geömetry, but not of the Euclidian geömetry alone, nor yet of the whole of the Euclidian geömetry; for part of the elements of Euclid are mere arithmetic, and might as well be so called. The name appropriated to this science would be, *geömetria*.

415. Trigonometry.

The application of arithmia to geömetria would produce the second specific science; but the selection of a name is attended with great difficulty. *Trigonometria*, which may be regarded as a received term, would be liable to two objections. In the first place, it would be ambiguous; as part of what is at present so called would be included in the preceding science. In another respect it would be imperfect, as it would not express, by its name, the whole of what would be included in the science. It is not the application of number to the *triangle alone*, which is under consideration, but the application of number to all geömetrical figure whatever; even including solids. The term, *arithmetico-geömetria*, would be exceptionable; on account of its being double. Throughout the whole of the nomenclature, single words are sought; and double words are avoided. It is not intended to be said that composite words are avoided, for geömetria is a composite term; but merely double words; as would be *arithmetico-geömetria* and *analytico-geömetria*. As the triangle measures all polygons, trigonometria would really be *polygonometria*. As all solids, for purposes of mensura-

tion, must be reduced to superficial figures, or, in other words, as polyhedral figures can be measured only through the intervention and instrumentality of polygonal figures; as all polygonal figures may be reduced to triangles; as all triangles may be reduced to right angled triangles; and as all right angled triangles are, and must be, measured by the circle, the sides becoming the sines of the opposite angles when the hypothenuse is assumed for the radius, and either side becoming the tangent of the opposite angle when the other side is assumed for the radius; the whole of mensuration, or, in other words, the application of number to defined space, may be thus conceived to be comprehended in the mensuration of the circle. An angle, it may be truly urged, cannot be measured, but in consequence of the previous application, and even that application perfectly arbitrary, of some number; three hundred and sixty, or any other; to the circle. As the arbitrary application of some number to the circle is the very first step in the application of number to geömetrical figure, the science, it may be contended, ought to take its name from this circumstance, and to receive the appellation of, *cyclometria;* including all the knowledge connected with the application of arithmetic to geömetry. But, on a more close investigation, it will be found that the application of the number three hundred and sixty to the circle, as the means of rendering angles susceptible of mensuration, is not founded in nature; and is, by no means, an indispensable process. It may with as much truth be said that the angle mea-

sures the circle, as that the circle measures the angle. A number may be applied, directly, to the *angle;* with as much convenience as it may be applied, directly, to the *circle.* Four right angles measure the circle, as much as the circle measures four right angles. The *right angle* therefore, it may be urged, is as much the element, to which the first arbitrary application of number must be made, as is the circle. The decimal, or rather centenary, computation may be deemed better than the sexagenary; and the application of the number one hundred, directly, to the right angle, may be preferred to the application of the number ninety, directly to the right angle; or what is equivalent, the application of the number three hundred and sixty directly to the circle. Thus the circle would come to consist of four hundred degrees; and the parts of angles, like the money of the United States, might be subjected to decimal or centenary computation. The right angle would thus become that element, or angular unit, from which the name ought to be taken, instead of the circle itself; according to the preceding reasoning. But an enquiry would still remain outstanding and unsettled as to the preference of the right angle, as an element, to some other angle; as for an example that of sixty degrees. As thus the real object to be attained is the dimensuration of some elementary angle, and of its parts; and as that is all which by this, or, in the present state of science, by any other process, can be attained; the word *angle*, in the Greek language, it has been imagined would afford, and at least for the ex-

isting state of knowledge, as eligible a radix as any other which could at present be suggested. The name therefore presented in the table of nomenclature is that of, *goniametria;* but in the synonymic table will be found all those which have been previously mentioned, together with a variety of others.

416. The higher geöme-try.

An equal degree of dubiety will not attend the name selected for the third science. The object of the application of algebra to geömetry is the investigation and explanation of what are called the higher or transcendental curves. It is sometimes called transcendental geömetry, and in the English language is frequently denominated *the higher geömetry;* and sometimes more simply *the high geömetry.* Hence, in that language, a catachretic expression, unknown to any other. A person is spoken of as being very *profound* in the *high* geömetry. Maclaurin uses this expression, speaking of Leibnitz. The radix selected for the name of the science is the Greek term, αγκυλος, curvus, crooked or bent; and the name becomes, *ancylometria.*

417. The second order.

There are, thus, three specific sciences deduced, having their common basis in space defined by figure, one of them embracing space defined by figure in the abstract, the second relating to the application of number to space defined by figure, and the third relating to the similar application of algebra; under the names of, geömetria, goniametria, and ancylometria. The name of the order comprizing the three is found-

ed on that of the principal specific science comprized in it; and becomes, *geömetrica.*

418. The first class.

There are, thus, two orders deduced; one of them, under the name of arithmetica, comprizing the two specific sciences of arithmia and analysia; the other, under the name of geömetrica, comprizing the three specific sciences, which have just been recited. It remains to connect these two orders, into one class; by a higher generic term.

The term selected for the name of the class is that of, *mathematica.*

This term is not free from objection. It is derived from a Greek verb which signifies to *learn*, and originally comprehended all human learning; which, indeed, at first, principally, consisted of what is now merely mathematical learning. Long custom has, however, sanctioned its use, and it has a determinate signification in modern languages; in which, as in many other instances, the mere etymology of the term has been entirely lost sight of. It has therefore been selected; but if a term importing abstractions, should be preferred, for the appellation of this class, that of, *aphæretica*, will be found, with others, in the synonymic table. One class is thus deduced, under the name of mathematica, embracing two orders, arithmetica and geömetrica, the one containing two, and the latter containing three specific sciences, making five specific sciences in the whole class.

419. The abstractions of motion, time, and power.

There are other abstractions to which the presentation of material objects to the observation of the human mind gives rise; besides the two which have been investigated, those of number and space. Of those the principal are the abstractions of *motion*, of *power*, and of *time*. They do not afford the basis, however, of any specific science. Motion must always inhere in a material object; and can by no means be conceived of, as distinct from it. The idea of time can only be acquired by having observed *a material object in motion;* and time or duration can be measured only by motion. Mr. Locke, indeed, imagines, if his sentiments are rightly recollected, that the idea of duration or time might be produced by the mere flow of ideas in the mind itself, independently of material objects; but it is not probable that he would have conceived it susceptible of dimensuration in the same way. Dr. Reid and Professor Stewart do not differ from him. It is not possible for us to imagine what might be the ideas of a merely human mind, which had never been acted upon by material objects; but in the case of a human being, as has been supposed, instantaneously created, with all its faculties perfect, it is certain that as soon as a material object has been presented to observation, in motion, the abstract idea of time or duration is immediately and necessarily produced; and, like those of number and space, when produced, is both indestructible and infinite. The idea of power cannot be separated from that of a material, or mental being, in which it is inherent; and with which it can only

be coexistent. We comprehend no powers in the universe but our own, and even those imperfectly; but we see so much power exercised in various ways, and we see so much of power exercised with the clearest evidences of design, that we are as naturally and necessarily led, when the understanding has not been perverted, to the idea of *an eternal and infinite intellectual power existing in the universe*, as to those of space and duration.

420. Matter as presented in itself.

The abstractions, therefore, to which the presentation of material objects to the observation of the human mind gives rise, in the mind itself, so far as they present the base of specific science, being exhausted, it will be necessary now to proceed to the consideration of the second point of view in which matter must be regarded by the intellect of man; which is, *as presented in itself*, without reference to the abstract ideas of which it is the origin.

421. Divisions founded on it.

Matter, as presented in itself, may be regarded in two relations; first, as presented in its ordinary and natural state; and, secondly, as presented in an extraordinary and artificial state.

Matter, as presented in its ordinary and natural state, may be considered under two relations; first, as presented to the observation of man upon the earth which he inhabits; and, secondly, as presented to his observation, not upon the earth which he inhabits, but in the heavens.

Matter, as presented in its natural state, to the observation of man, upon the earth which he inhabits, may again be regarded under two points of view. The first of these respects the cognizance of objects in their number, difference, and external characteristics, in general; and the second their powers, internal qualities, and the general relation of cause and effect.

422. Natural history.

The cognizance of objects, as respects their exterior characteristics in general, has the ordinary name of *natural history*. Like almost all the present scientific terms, it is attended, in its use, with a double ambiguity; which is the source of constant confusion. First, its boundaries are unsettled, and it is not known what appertains to it, and what is excluded; and, secondly, it not only itself stands in the double position of species and genus, but many of its subordinate departments are in the same situation.

423. Its indefinite boundaries.

Perhaps Pliny, among the ancients, and Lord Kames, among the moderns, occupy the two extreme points on the question of boundary. Among the ancients, and especially among the Romans, the term natural history comprehended whatever of physical knowledge was then possessed, whether it respected this globe; or the other worlds which compose the universe. Geögraphy was a branch or department of natural history. Astronomy also was deemed a branch of natural history. Even the sciences relating to medicine; including the names and nature of diseases; the names, the arrangement, and the nature of medi-

cines; and the means of preventing or of curing diseases; were considered by the Romans as branches of the great stock or stem upon which they bestowed the appellation of natural history. Natural history embraced almost every department of the science, and even almost every department of the arts, of the times; religious, moral, and political knowledge, almost alone excepted. Into its capacious bosom were poured, in brilliant and undistinguishing profusion, all the riches of the mineralogical, the botanical, and the zoölogical empires; of natural philosophy, of astronomy, of geögraphy, of medicine, of chemistry; and of all the useful arts. Lord Kames, on the other hand, would consider natural history as a mere collection of physical facts, respecting minerals, vegetables, and animals; reserving to other, and to more elevated sciences, the explanation of those facts, and whatever of theory, or of speculation, might be adduced concerning them.

424. Its equivocal scientific character.

Natural history has not only been considered itself a science; but, again, changing its character, the prolific mother of many sciences. It has been divided into the following six great branches, each of which constitutes a distinct science of itself; those of zoölogy, botany, geölogy, mineralogy, hydrography, and meteorology; of which the latter forms the connecting link between natural history, on the one hand, and natural philosophy and chemistry, on the other. Like its own polypus, natural history, further, does not stop at the second generation, but pre-

sents even three generations of sciences, all living at the same time; parents, children, grand children, all participating the same genial fluid, in one common current of vitality. Accordingly, not infrequent are such expressions as the following. "In the science of *ornithology*, there is much to engage the attention of the naturalist." "Notwithstanding the importance of the science of *entomology*, the history of our insects has solicited but little attention." To the rank of a specific science *ichthyology* interposes an importunate demand; and *elminthology* only attends the decision of the claim to advance similar pretensions. If some of the German naturalists are correctly apprehended, even *anthropology* begins to rear its humble head. Is there indeed none to say a word for *ophiology* or *herpetology?* The ingenious and eloquent discourse of the late illustrious Barton of Pennsylvania, on the principal desiderata in natural history, and on the best means of promoting this science in the United States, displays, in glowing colours, this confusion and imperfection of the subject of natural history; and to that masterly production many of these sentiments appertain.

425. Limited.

On the common basis of the cognizance of natural objects, in relation to their exterior characteristics, are founded in this classification and nomenclature, four specific sciences; one of them relating to the terrestrial globe itself, and the others to the three physical republics, of minerals or fossils, of plants, and of animals, with uniform names, of Greek etymology, an-

nexed to each respectively; endeavouring to combine the common idea of *general cognizance*, with the particular Greek radical for *earth*, *fossil*, *plant*, and *animal*, respectively.

426. Named.

The term which has been selected, from the Greek language, to import the idea of general cognizance, is that of, γνωσις. There are three terms in the Greek language all signifying knowledge; γνωσις, επιστημη, and ειδησις. I have been favoured with an exact criticism on the distinction in the import of these three several terms by the reverend Dr. John M. Mason, of New-York, and by the reverend Dr. Wilson of Philadelphia; and, after availing myself of the advantages of their superior and distinguished erudition, I have become satisfied that the selection had not been incorrectly made of the term, γνωσις, to answer the purpose intended in relation to the present order of sciences, and to that which is immediately to succeed.

The four terms thus come out in the forms of, *geögnosia*, *oryctognosia*, *phytognosia*, and *zoögnosia;* indicating the four specific sciences which have for their base, respectively, the globe of the earth, the fossil, the plant, and the animal. They are comprehended, in the order, under the appellation of, *physiognostica.*

427. Pronunciation of the names.

The English scholar will have to be apprized of a peculiarity, with respect to the pronunciation of these terms; in which he would be deceived by an implicit confidence in the organs of vision

alone. He meets but rarely, in his vernacular language, this singular anomaly. In such terms as, *gnomon*, *gnomonics*, *gnostics;* he dooms, in his pronunciation, to a mute the primary letter. In such other terms as, *physiognomy*, *physiognomist*, *physiognomer*, *prognostic*, *prognosticator*, *diagnostic;* he combines the unfortunate consonant with the precedent vowel. It must be acknowledged, with respect to the terms, which have been recited, of this nomenclature; that if the delicacy of the Grecian pronunciation cannot be attained; the first course is less preferable.

428. Sanction of the names.

Of these terms, the two first have already the sanction of the continental portion of Europe. To the third, has attached that of the American Barton, deliberately formed. He preferred, without a remnant of dubitation, the radix φυτον to the radix βοτανη; for the name of the science which has reference to plants. The one, from φυω, gigno, includes every thing which has vegetable growth, "*from the cedar tree that is in Lebanon even unto the hyssop that springeth out of the wall;*" the other, from βοω, pasco, relates principally to the productions which constitute the food of the graminivorous animals. The reasons cannot now be conveniently assigned why the termination, of the received name for the fourth and last science is inadmissible, with perhaps but a single exception, into the specific nomenclature. The generic term is almost a translation of the received name. *Physio-historica* would have appeared literally so, but, independently of other reasons, it remains doubtful whether the

term history was thus applied by the Greeks; and, if even of legitimate use, the radix which has been selected appears to be entitled to an intrinsic preference.

429. Caledonian ridicule.

The two first terms have received, in advance, the ridicule of the constituted authorities in criticism of the Caledonian metropolis. It is an amusing spectacle to behold those ephemeral existences, fluttering, with entomic temerity, around such blazing minds as a Werner and a Cuvier.

430. Natural philosophy.

In contrast with the Greek term, γνωσις, importing the general and exterior cognizance of the objects of nature, has been selected the term, σοφια; to indicate the knowledge of nature, as respects interior powers, and the general relation of cause and effect. That knowledge of nature which enlarges human power, and, therefore, has reference to human action, seems to be implied in the contrast of these terms; and this distinction appears to be recognized in the ordinary term, natural philosophy, as contrasted with that of, natural history.

431. Limited.

Natural philosophy, though it has been so much cultivated, does not appear to have been ever well divided; and yet, like mathematical science, it is deemed susceptible of a clear division.

Matter, as the subject of natural philosophy, may be considered as presented to the observa-

tion of man in five distinct forms or states; first, in the solid state; secondly, in the fluid state; thirdly, in the aërial, gazeous, or gazic, state; fourthly, in the luminous state; and lastly, in the electric state. The combination of the term, σοφια, with the particular Greek radical for *water*, for *air*, and for *light;* would present the principle of the nomenclature for the three intermediate sciences. The Greek radical for *earth;* as one of the principal solids, in like manner as water is the principal fluid; may either be selected for the first science, or the term solid itself. The existence of electric matter was unknown to the Greeks, and they therefore could have no name for it; but our own name is derived from their language.

432. Named. The appellations, which would thus be deduced for the five specific sciences, which have been under consideration, would become; *stereosophia*, *hydrosophia*, *aërosophia*, *photosophia*, and *electrosophia*. The term *geösophia*, contemplating the globe of the earth as the first great solid, presented to human observation, and as affording a more natural gradation, in association with the other subjects, I should have preferred, as the name of the first science; but every gentleman whom I have consulted, without a single exception, gives the preference to the term *stereosophia;* and according to a rule, which I have prescribed to myself, in the prosecution of this enterprize, as nomenclature is eventually a matter of convention, I have yielded my own judg-

ment and predilection to that of a majority of others, when it can be clearly ascertained.

433. Evanescent sciences.

In this place, it will be proper to explain what is understood by *evanescent sciences*. When a mass of facts have been gathered, which cannot be reduced into some known science, it is proper to erect them into a distinct science; subject to be established or annihilated, augmented or diminished, according to the future progress of knowledge. Thus a collection of facts has been made in relation to magnetism, and to galvanism; of which the character has, for a long time, been equivocal. The progress of knowledge, with respect to the latter, has at length reduced them to electricity. The science may, therefore, already be regarded as evanescent; and as merged in the greater and principal science. If it had not arrived to this state, it would not have been difficult; by selecting a radical term, from the Greek language, signifying *irritation*, or *irritability;* to have devised a name for it. The former science is destined to undergo the same fate. It has not, however, yet advanced to the state of actual evanescence. Though the suspicion is strong, the scientific mind is not yet actually satisfied that the facts relative to magnetism, may be reduced to the same class with those which appertain to electricity. The science is therefore retained, under the name of *magnetosophia;* making six specific sciences in this order.

434. The order of

The name selected for the order is that of, *physiosophica*. The term φιλος is too vague to be

physio-sophica. admitted into the nomenclature. It may be applied to any one science as much as to another; and to any one order, or class of sciences, as much as to any other. The term φυσις, on the contrary, appears to impart a peculiar energy to the word. It expresses precisely the base of the order; and, by its combination, exhibits its contrast with the order preceding.

435. Astronomy. Matter presented to the observation of man, not upon the earth which he inhabits, but in the heavens, constitutes an order; containing but a single science. The received name of this science is, perhaps, as good as any other which could be devised. Wherever there is action there is law; and the investigation of the laws of the action constitutes all the science which man can attain respecting material objects, in the celestial regions. The name, therefore, presented in the table of nomenclature is, *astronomia.* Mr. Jay would have preferred the term *urania.* It is presented in the synonymic table. The name of the order may either be, *astronomica*, or *uranica.* The latter is presented in the table of nomenclature, and the former in the synonymic table.

436. Chemistry. Matter, as a subject of human investigation, not in its ordinary and natural state, but in an extraordinary relation, the effect of human power and human art exercised upon it, constitutes also an order; containing but a single science. The received name is also again selected. The name of the science is, *chymia;* and of the order, *chymica.* The learned Dr. Mitchill pressed

me to divide the chemical department into two specific sciences, one of them founded on *heat*, and the other on *mixture;* for which he supplied me with the appropriate names, corresponding with the other terms in the nomenclature, in being of Greek etymology. Regarding, however, *heat* and *mixture* as merely the means of knowledge, rather than the subject matter of it, I have not yielded to the pressure. I feel it my duty however to state the proposition, as a proper subject of investigation; and in order that, if I should have erred in my judgment, the means may be afforded of correcting the error.

437. Sentiments of Dr. Patterson.

Dr. Patterson, professor of mathematics and natural philosophy, in the university of Pennsylvania, would propose sundry alterations in those two departments. He would consider the application of arithmetic, and of algebra, to geömetry, as constituting but one science; and the higher geömetry the third. He would consider the laws of motion, and the doctrine of forces, as entitled to form a distinct science. He would form a distinct science for all radiating matter, and he would invert the order of astronomy and chemistry; considering the latter as the proper and immediate associate of natural philosophy. The late Dr. Barton, on this question, was of the opposite sentiment. He considered the natural affinities as better sustained, by placing astronomy before chemistry. Dr. Patterson observes, and, it is conceived, with the strictest propriety; that *no general division can be properly tested until it is carried out into detail.*

438. The class physica. Having thus four orders of sciences, founded on matter, as presented in itself, for their common basis; the orders respectively of, physiognostica, physiosophica, uranica, and chymica; it remains to connect these orders, by an ascending generic term, into a class. The term selected for the name of the class is that of, *physica.*

439. The province hylica. Thus two classes have been obtained, those of mathematica and physica; the one founded on the abstractions to which the perception of matter gives origin, and the other on matter itself. It remains to connect these two classes, by an ascending generic term, into a province. The Greek term for matter is selected for the radix of the name, ὑλη, materies; and the name of the province thus becomes, *hylica.*

440. Digression. This finishes the first province of the first table; and before proceeding on the second province of the first table, it may be proper to enter into some explanations of which the necessity will perhaps begin to be perceived.

The expression has hitherto been used of a *specific science;* nor has the use of this term been attended with any inconvenience or ambiguity. Throughout the whole of the first province no subject occurs of that grade, but such as may readily, and without any violence to received language, be recognized as a science. The case will not be the same through the whole range of human knowledge. An ambiguity will attend the farther use of the term *science;*

and this ambiguity it will be indispensably necessary to overcome.

441. Ambiguity of the expression, *arts* and *sciences*.

The term *science* is used in the English language, both by prosaic and poetic writers, in a great variety of senses. Sometimes it bears its strict etymological import, and signifies knowledge in general. In this sense it is used in a prose composition of Mr. Pope, in the second volume of his works. In this sense it may be conceived to be used by Mr. Mason, in the title of his work on *self-knowledge;* which he stiles *a treatise shewing the nature and benefit of that important science.* The following lines exhibit the same sense;

> *" His soul proud* science *never taught to stray,*
> *" Far as the solar orb, or milky way."*

In the following remark, and, in the versification of it by Mr. Pope, the general import of the term is brought into direct contrast with the specific; *good sense, though not a* science, *is fairly worth the seven.* In the following poetic lines its specific import is figuratively adverted to;

> *" Hast thou ever weigh'd a sigh,*
> *" Or studied the philosophy of tears?*
> *" A* science *yet unlectur'd in our schools."*

Its specific import is adverted to in the passage, in which Mr. Pinkerton informs us; *that housekeeping, or domestic economy, is made a distinct* science, *in Japan, and is thought as important as that of astronomy.*

Sometimes the term science is used to signify a great range and class of sciences. In this manner it is used by Mr. Hume, and by Dr. Robertson. The former entitles one of his essays, *that politics may be reduced to a* science. It is very frequently used in the English language in contradistinction to *art;* and, when thus used, the expression *arts and sciences* is understood to include all human knowledge. In the enumeration of the systems three or four instances are presented of this use of the term; and it is recognized by a variety of poets.

The editors of the Encyclopædia Perthensis recognize, distinctly, the poverty of language, in this respect. They advert to subjects, constituting important departments of human knowledge, which are not *sciences;* and which can still less be regarded as *arts.* History is not a *science,* and still less is it an *art.* Could religion be considered as a *science?* Still less could it be considered as an *art.* If *oratory* should be presented, to an English critic, among the *sciences,* he would immediately expunge it. *Oratory,* he would inform you, is not a *science;* it is an *art.* If the attention be attracted to *voyages* and *travels,* they are neither. It would be absurd to call them a *science,* equally so to call them an *art.* They are readily admitted to be a *department of knowledge;* they are even admitted to form an *important* department; but there is neither *place,* nor *name,* for them as such. They must, therefore, be rejected from a system of human knowledge; or must be regarded among the anomalous depart-

ments, and thrown into an appendix; or form a section in the absolving chapter of *miscellanies*.

It is not from any intrinsic difficulty in the subject itself that this course must be pursued; but merely because language does not accommodate itself, in this instance, to the nature of things. All knowledge must first be, without any necessity for it, either *science* or *art;* and then there is some *important* knowledge which is neither. It must have been frequently observed how inextricably embarrassed metaphysical writers become by this stubbornness of language; and how injudiciously they always endeavour to overcome the difficulty, by attacking the received use of words, and attempting to change their meaning, or to enlarge or restrain it. In following the same path, it might thus be here said, with Dr. Barron, that the *theories of all the arts are sciences*, or one step farther might be taken; and it might be contended, in the stile of general Bulow, that every *art*, when its principles have been investigated and determined, and are explained in a written treatise, is *reduced to a science*. Somewhat similar may be the meaning of Mr. Hume, when he tells us, *that politics may be reduced to a science*.

442. A new term invented.

In the preceding parts of this discussion the expressions, *individual science*, *particular science*, *specific science*, and *separate and distinct science*, have been so frequently used, that it is presumed, so far as the use of those terms has

hitherto been extended, they cannot possibly be misunderstood. If they were, notwithstanding, imperfectly conceived, the expression *scientific unit* it is imagined would obviate any ambiguity; at least in the United States, where the money unit has been adjusted, with such precision, in popular use. But, when the nomenclature comes to be applied, it is presumed that the attachment of the *specific termination;* as contradistinguished from the generic termination; will preclude all possibility of error. In aid of that principle, will also be presently explained *by what terminations the parts of a science* are distinguished from a specific science; as that is from a family of sciences. A department of human knowledge invested, according to the principles of this system, with this character of unity, or individuality; and designated by the reception into its name of the specific termination; and which, in ordinary parlance, may now be a science, and may now be an art, and may now, in the strict use of those terms, be neither; wants only a denomination by which it may be recognized, of whatever description it may be, in those other respects. As language does not supply such a name there is only one resource left. *It must be invented.*

In obedience to the law requiring the selection of radical terms from the Greek language, the Greek term, επιστημη, scientia, has been selected, as the radix of the term which is sought; and that term thus becomes, *epistemia.*

443. Reasons of its selection.

The radix of this term differs from the Greek word heretofore introduced as signifying *knowledge*, that of, γνωσις, in this particular; that it imports *certain and exact knowledge*. Nor is it a mere translation into the Greek language of the English word *science;* as it might appear to be, on a superficial view. The ancients did not use the term science, as it is used in modern languages. What we term *sciences*, they always denominated *arts*. The radix of the selected term imports only *certain and exact knowledge;* and as this may be attained in relation to many different subjects, it is an appropriate term. As technically used, and in relation to this system, the term, *epistemia*, imports, *a specific department of human knowledge*.

444. Two subordinate terminations.

The subdivision of an epistemia is denoted by two subordinate terminations. The terminations which have been selected, to denote the subdivision of an epistemia, may, it is conceived, be barely stated; without any elaborate explanation of their respective etymologies, or of the reasons which have predominated in their favour. They are, *logia;* and, *graphia*. An example will render their use immediately understood. In the first province of the first table, but the second province of the second table, in the class physica, in the order physiognostica, is found an epistemia, under the name of *zoögnosia*. It is known, by its termination, to be specific; and to be also an appurtenance to an order of a certain description, relating to natural history. The term, with which its duplicate termination is combined, in-

dicates it to relate to the *natural history of animals*. If, in prosecuting that subject, a term should be met with, such as, *amphibilogia*, its termination, *logia*, would indicate that it was *a ramification of an epistemia;* and the radix, with which it was found, would indicate that that particular ramification related to the *amphibious* class of animals. If, now, in further prosecution of that subject, the amphibious class of animals, such a term as, *saurographia*, might occur; its termination, *graphia*, would indicate that it was *the subdivision of a particular branch of an epistemia;* and the radix, with which it was found in combination, would determine that it related to a particular sort of animal, in the amphibious class, the *lizard*. This, it is presumed, may, in the present stage of the discussion, illustrate in what manner an epistemia is subdivided into ramifications and sections; without additional elucidations from any other sciences. Time will not be consumed in explaining, here, how the first syllable of the termination may be gradually lost; how, in one instance, the termination would appear to be admitted among the specific sciences; or why, in two instances, the termination admits of a variation. These minor details would prove only an embarrassment, until the whole of the epistemias have been regularly deduced.

445. The synonymic table explained.

It is now clearly perceived that, from peculiar circumstances, the fourth part of the discussion must be deferred. The appendages to the three first parts must, in consequence, be postponed. The synonymic table, which cannot there-

fore immediately appear, has been mentioned. It is necessary to explain what is intended by it.

The course pursued in the construction of the chemical nomenclature, in France, could not be exactly imitated, in America; and in relation to this particular object. A body of men could not be assembled, in any one place, who might be consulted on the nomenclature. As far as circumstances rendered it practicable it has been adopted. Particular persons, in particular states of the Union, have been consulted. Those already included, comprehend; Delaware, Maryland, New-Jersey, New-York, Pennsylvania, and Virginia. It has been regretted that the eastern states could not, at present, be comprized. It has been repeatedly said, in the course of the investigations, that the science of our country resides there. It is proposed, on a future occasion, to extend the operation thus far. In the extent to which the consultations have been actually carried, not only have all the objections to the divisions which have occurred been noticed; but every term, as far as known, which has been already used or proposed; and every term which has been suggested by the persons who have been consulted; and every term which has suggested itself to the mind of the author of the system; have been regularly inserted, together with the authorities, in the former instances, from which they are derived. As thus all the terms which have been used, or can be suggested, will be collected; if, in making a selection from them, the particular author of the system

should have erred, the materials on which his judgment was formed will be presented to those who may succeed him in the investigation. By the same process, also, the number of synonymic terms may be enlarged; and certainty and satisfaction, thus, at length, attained; if the divisions, and the principles of the system, should be approved. If not, better divisions, or a better system, may be devised; and the benefit of copious supplies for a nomenclature may still not be lost; or, at least, the procedure elucidated by which those supplies may be obtained. It is thus presumed that whether the present system, or the present enterprize, should succeed, or not; a path is evidently opened by which a satisfactory system and nomenclature of the sciences will be obtained.

446. Seven laws on the transposition of the Greek letters.

There are certain laws, which it will be perceived have been obeyed without having been stated; relative to the transfer of words from the Grecian into the vernacular languages. Thus the *kappa* becomes uniformly converted into a *cee;* the *upsilon* into a *wye;* the *gamma*, before the kappa, into an *en;* the *oi* into *œ;* the *ai* into *æ;* the *ei* into *i;* and the *ou* into *u;* and, when thus converted, the pronunciation obeys the analogies of the language into which the word is received. It will not answer, in the present state of science, to inquire into the reasons of these laws; or to dispute their obligation. For the present, they must be implicitly obeyed. A proper place will occur for adjusting the pronunciation of the ancient languages; and considering how far de-

rivative terms, in vernacular languages, ought to conform to it. For the present, the analogies of the vernacular languages must, without exception, be adhered to. The laws, to which allusion has been made, were obeyed by Linnæus; and by the authors of the chemical nomenclature.

Grammatical exactitude, at the first view, appears a minutia unworthy of elevated intellect. The proud mind of the modern philosopher will view, with a smile of supercilious contempt, the introduction of these new *micrometers* to dimensurate the breadth of a consonant; and of these new *barometers* to determine the specific gravity of a vowel. That exactitude, however, even in letters and syllables, and in subjects where it was less requisite, occupied the most distinguished of the ancients; because it was the very foundation of that eloquence which conducted them to the highest honours of their republics. Cicero; who himself from an orator became a consul; compares these minutiæ, and not inaccurately, to the roots of trees. Roots and stems, indeed, and stalks and trunks, are objects at once uncleanly and rough; presenting, in themselves, nothing agreeable or attracting; but they secern, assimilate, and distribute, the precious juices of the plant; and it is to their humble and unsightly, but necessary and indispensable agency, that we are indebted for the foliage, the umbrage, the verdure, the fragrance, the flavour, of the whole vegetable world; for all its variegated brilliance, for all its exquisite voluptuousness, and for all its expanded utility.

447. Further incidental matters adverted to.

It might be proper further to improve the present opportunity to explain why, in the prosecution of the discussion, the quotation of authorities; and the acknowledgment of the passages, or of the expressions, which have been copied, borrowed, or imitated; have not been, invariably, made. It has been deemed important, in the state of science, in this country, to present *an unbroken text*. This is a point which will merit farther remark. It is sufficient, for the present, to observe that the mind of erudition will by no means be disappointed in a reference to proper authorities; but, for the ease of those who might not be competent to consult them, a new mode of exhibiting them has been devised, by collecting them in one table, at the close of the discussion; so as entirely to avoid the frequent and constant interruptions which they would occasion.

It must be farther acknowledged that some little history of the rise, progress, and manner of conducting the present enterprize, will be necessary; but it is deferred to some future opportunity. Imperious circumstances now require that the discussion should for the present, be brought to its close; and having crowded into the interval, between the first and the second province, a number of subordinate particulars, which, it was conceived, had better be disposed of, at once, the space remains clear for proceeding into the investigation of the second province, comprehending the epistemias which arise from *the union and coexistence of matter* and *mind*.

448. The second province.

Matter in union with mind is presented to the observation of man only in *animals;* nor do any animals inferior to man afford the base of any collection of sciences, or even of any specific science, regarded as *a combination of matter and mind.* The animals inferior to man, and man himself, are subjects of science in relation to the matter and to the mind of which they are constituted, considered separately; but man alone affords the base of science regarded as *a combination of matter and mind.*

As man alone presents the base of the sciences in the second province, it might, without any impropriety, from that circumstance alone, derive its name; and the appellation of the province might be *anthropica.*

But as the province is based on *the union of matter and mind,* if the name, selected for the third province, should be suceptible of a ready combination with that, which has been adopted for the first; the union of those respective radices would most naturally, and elegantly, express the name of the province, which regards matter in coexistence with mind.

The radix selected for the name of the province, which is founded on mind alone, is the Greek term, εννοια, cogitatio. It is preferred to many other terms, which will be found in the synonymic table, because it assumes nothing. The name is derived simply from a fact. The existence of mind, distinct from matter, is not

necessarily implied; and the contrary doctrine may be contended for, without any inconsistency of phraseology. In obedience to the various laws which have been stated, the name becomes, *ennœica.*

The combined name, designating the second province, in the same manner, becomes, *hylennœica.*

The names of the provinces, in the first table, thus come out to be; *hylica*, *hylennœica*, and *ennœica.* The two radical terms have the highest authority. Plato uses the first of them, and Demosthenes the second; and both in the same senses in which they are here applied.

It is a matter of the less consequence by what names the two first provinces are, at present, denominated; because, as will be perceived, both names become evanescent in the second table. The last term, *ennœica*, only remains permanent.

The province of hylennœica, in the first table, comprehends three classes.

449. The first class.

The first of these regards man as possessed of the faculty of speech; and all the epistemias which have their common base in human speech are contained in this class. The name of the class itself is taken from the principal epistemia in it, which will be presently exhibited. In general, the synthetic explanation of the nomencla-

ture will now be fully as intelligible as the analytic; using those terms in their modern senses, and in senses directly the reverse of those in which they were used by the ancient Grecian geömetricians. In this instance, however, of the epistemias founded on human speech, an exception must be made; on account of the novelty of the term introduced to signify human speech.

450. Its orders.

The class founded on human speech is divided into three orders, under the names, respectively, of; *grammatica*, *dialectica*, and *callilogica*. The latter term is almost a literal translation of the French term, *belles lettres*, into Greek. *Calligrammatica* would have been a literal translation into Greek of the received French term. Reasons will be perceived, sufficiently cogent, for the deviation. No explanation it is presumed will, at this stage of the developement of the nomenclature, be requisite with respect to the two first terms.

451. Epistemias of the first order.

The order grammatica is divided into two epistemias. The first of these regards speech in relation to its elements. The second epistemia relates to speech in its concrete state.

The radix selected for the name of the first epistemia will admit of no dubiety. It is the Greek term, γραμμα, γραμματος, a letter. The genitive case of the original word, with the termination struck off, uniformly forms the radix, in the construction of this nomenclature, where it

is practicable. Thus the name adopted for the science of grammar becomes, *grammatia.*

The term *philology* is inadmissible into this nomenclature, for two reasons; first, because the term φιλος is in itself too vague, and might as well be applied to every department of knowledge as to any one; and, secondly, because the termination is appropriated, in general, to another purpose, that of distinguishing the first ramification of an epistemia. It is remarkable, also, that in that term the wrong radix has obtained; λογος being less appropriate than γλωσση. It has been, therefore, indispensably necessary to seek some other name. That which has been selected is *anthropoglossia.* It is a literal translation of the term human speech, or human language; and thus, exactly, expresses the subject of the epistemia in its name. It is a term sanctioned by high classic authority. It is used by Aristotle. In speaking of the parrot he stiles that bird, ανθρωπογλωττος; as if to say *human-tongued*, or speaking with a human tongue. There will be found many terms, which have come into competition with this, in the synonymic table; but this has obtained the general preference.

452. Epistemias of the second order.

The order dialectica contains also two epistemias; those of, *logiotetia*, and *rhetoria.* The first name is founded on the Greek radical, λογιοτης, λογιοτητος, ratiocinatio, reasoning. By a figure it also signified eloquence. The second name is founded on the received term; and merely

changes the term *rhetoric* from the adjective form which it possesses in the original.

Mr. Jefferson was of opinion that logic, if intended to imply the mere art of reasoning, ought to be abolished. Though logic has been so much abused, it appears, notwithstanding, that the first application of language; that of using it for the purpose of convincing the judgment; is too important a step in the progression of the human mind to be passed over without attention. However few may be the principles on which correct reasoning depends, their importance invests them with a certain degree of dignity.

This is one of the instances in which, in the present state of science, two distinct subjects are contained under one name. It has thus been productive of great embarrassment; and has, in no small degree, retarded the progress of knowledge. Under the name of logic the expositors of that subject not only include the art of reasoning; or the application of language to the purpose of producing conviction; but the science of the human mind itself. It was this conjunction which embarrassed the mind of the American Dr. Johnson. It will be found that every step in his division of human knowledge was perfectly sure, until he arrived at this subject. From this step forward he falters, and never regains his ground. In attempting, cursorily, to explain the principles of this system to the reverend Dr. Beasley, provost of the university of Pennsyl-

vania, I encountered precisely the same difficulty; and I am afraid it proved fatal to my object, as did also, perhaps, the term metaphysics, with the reverend Dr. Staughton. The application of language to the purposes of persuasion appears naturally subsequent, in the order of things, to its application to the purposes of conviction. Aristotle, however, inverts this order; and rhetoric is regarded as a precedent art to that of logic.

453. Epistemias of the third order.

Like mathematics, like natural philosophy, like moral philosophy, and a variety of other subjects, the term *belles lettres* has been extremely vague and unsettled. The diversities of sentiment, among Mr. Rollin, Baron Bielfeld, Dr. Willich, and others, on this subject, are not a little remarkable. Perhaps in none are they wider, except as relates to the fine arts; among which, indeed, many parts of the belles lettres have sometimes been classed.

It is a subject, notwithstanding, which appears to admit of a clear division. It is divided, in this system, into four epistemias; those of, *callilogia*, *poësia*, *euphradia*, and *diacrisia*, respectively; comprehending, under the first term, *fine writing*, or *composition*, *in prose*, in general; under the second, *fine writing*, or *composition*, *in verse*, or *measure*, in general; under the third, *fine language in the oral form;* and under the last, *the application of language to all its objects*, *successively*, *as it is exhibited in actual works and productions*. The received names would be, for the three

last; poetry, oratory, or eloquence, and criticism. The first does not appear ever to have received a distinctive name. In this system its name is founded on the two Greek terms, καλλος, pulchritudo, beauty, and, λογος, sermo, discourse. The name of the order is derived from that of the principal epistemia in it. In the generic form it extends to the subject of language; used with respect to the sense of taste, or beauty, in general. In the specific form it relates to fine written composition, in the prosaic form, in particular. This is the only instance in which the word, λογος, is admitted into either the generic, or the specific nomenclature; and the reason will be obvious. It is here used not as a termination, applicable to many different radices; but in its distinctive character, as the Greek term for speech, applied to the purposes of discourse, or discussion, in general. The Greek language afforded two names for poetry; ποιητρια, and ποιησις. The term *poëtria* has in general been less often preferred than that of *poësia*. Either would exhibit an infraction of the laws prescribed, and in every other instance obeyed. Here custom is not only inveterate, but, with the exception of Glasgow, universal; and, to whatever causes the anomaly may be owing, modern language will not bear such terms as, *pœtria*, and *pœsia;* though it admits, with so much ease, such terms as, *epopœia*, and *pharmacopœia*. In the polite and literary society of Glasgow, in Scotland, the pronunciation of the modern words, *poet*, *poetry*, *poem;* indubitably, in reverence of the *os rotundum* of the Grecians; is, *poyet*, *poyetry*, *poyem*.

It is further extremely remarkable that the Greek language does not furnish a direct term for eloquence. The terms, δεινοτης, λογεοτης, and a number of others, are evidently figuratively used. Gregory Nazianzen, the illustrious Christian bishop, who flourished near the times of primitive Christianity, at Constantinople, is an authority for the term which has been selected; and which is used, by him, in precisely the same sense.

The name of the class is taken from the principal epistemia in it, *anthropoglossica*. Thus the first class, anthropoglossica, of the second province, hylennœica, of the first table, contains three orders; grammatica, embracing two epistemias, grammatia and anthropoglossia; dialectica, embracing also two, logiotetia and rhetoria; and callilogica, embracing four, callilogia, poësia, euphradia, and diacrisia; making eight epistemias having their common base in human language, and exhausting that subject.

454. Properties of the first class.

The concinnity of this class is perhaps more remarkable than that of any other, though perhaps the class mathematica may admit a comparison. The fifth law is implicitly obeyed. The first science of the eight, if all might be permitted to be so denominated, is elementary to the second; the first order is elementary to the second order; the two first orders are elementary to the third; and the whole of the preceding sciences are elementary to the last. Among themselves, the sciences dependent on human speech

appear well arranged; but the whole of those sciences, in relation to other orders and classes of sciences, do not appear to occupy a natural position. It will remain to shew, hereafter, how this difficulty is to be effectually obviated.

455. The second class.

The second class of the province hylennœica comprehends all the epistemias which have their common base in *human power;* all those sciences, and all those arts, which if the human *dynamis* were supposed to be suddenly annihilated would perish with it. In the province of hylica, the idea of human power is not necessary to the existence of any of the sciences, not even of the abstractions; for these must be imagined to remain in nature, though the human race might be supposed to be annihilated. In that province, the power of man begins to appear in the last science; that of chymia, or chemistry. But it is not essential to the existence of the phænomena, for many chemical operations are performed by nature; and on an infinitely grander scale than those which may be effected by human art. In the present class, on the contrary, human power is essential to the existence of every particular science; and, if that be removed, not one of these sciences can have any foundation. As a collection of sciences this class is entirely new, and presents to the observer new affinities; which, if they should be found to be correct, are highly important. The name of the class is a mere translation into Greek of the base on which it is founded, *anthropodynamica.* The term is objectionable on account of its length. It is

the longest term in the generic nomenclature; that of the provinces, classes, and orders. It is further objectionable on account of its approximation to the preceding, that of, anthropoglossica. At the present day the term, dynamica, alone, from an accidental circumstance, would be attended with ambiguity. It has already been introduced into science for an entirely different purpose. Was it thus introduced by D'Alembert? Equally imperfect, and also from accidental circumstances, would be the term, *glossica*, alone. Perhaps, at some future day, the radix, ανθρωπος, might, if necessary, be omitted in both. I have been much pressed to adopt, in this instance, the term, *androdynamica;* and some lines of Homer, in which ανηρ is obviously used, in the common gender, have been adverted to. The true base of the class is, *human power*, and not *male human power;* and I have been so solicitous to preserve the purity of the nomenclature, that I have not yielded to this pressure, though, in every other respect, it would be desirable. The term, therefore, though not adopted will be found in the synonymic table. The term, δυναμις, seems to be essential to the name of the class, in some form.

The power of man may be exercised either over matter, or over mind, or over both.

456. The first order.

The power of man over matter is first exercised over the matter of his own body; and the principal object which, in this exercise of his power, he has in view, is the preservation of

his own being. The nutrition, the health, the vigour, of his body, and the victory over the many enemies which assail it, engage his earliest and most indispensable cares; and present the base of the first sciences which are founded on the application of his power.

Medical science, like so many other subjects which have been mentioned, though so highly cultivated, has never been well arranged. No two persons of those best acquainted with the subject will concur in their answers to the following interrogatories. Is medicine a single science, or is it many? If many, how many? What are their names? What is their proper succession? Do the subjects named comprehend the whole of medical science; or may there be some other medical science not comprehended in any of them, and if so what may it be, and where might it be expected to be found?

The division, which will be presented, ought to have been subjected to the strictest criticism of gentlemen of the medical profession; and would have been so, if their attention could have been attracted to it, in the present stage of this enterprize. It may, with safety, be hazarded; as their profound researches will soon detect and correct every latent error.

The appellation selected for the order is that of, *iatrica*. It is derived from the Greek term, ιατρος, medicus; which the English call a physician. This order I have sometimes dilated into

as many as twenty-two specific sciences, with appropriate names, of Grecian etymology, attached to them; and have, afterwards, contracted those twenty-two into eight. The person who becomes intimately acquainted with the principles of the nomenclature will be able to perceive that such an operation neither multiplies nor diminishes the subjects themselves; that none of them can be evanescent; and that even their order cannot be changed. The only difference which results is, that a subject, which is not elevated to the rank of a specific science, and which therefore does not receive the specific termination, in its distinctive character, into its name, combined with a proper Greek radical; must be a branch or ramification of a specific science, and will be designated, as such, by the reception of the termination, *logia*, into its name, combined with the same radical. It is an experiment, however, which affords the best test of the accuracy of a division. It also shews how, as subjects deemed important in one age, and regarded as less important, or as quite frivolous, in another, may descend from the rank of specific sciences to mere subdivisions and ramifications of some other specific science; and how, on the contrary, subjects which, either from error of judgment, or from ignorance, have been underrated in one age, and have therefore formed but some obscure branch, or even section, of a specific science, may rise to the rank of specific sciences themselves; and, in both cases, without affecting the principles of the system, or, in the smallest degree, impairing its harmony. These experi-

ments; another of which has been, attentively, made, in another department of knowledge; conclusively demonstrate the extreme flexibility of the system.

457. The first epistemia.

The first science, in the order of iatrica, receives the name of *anatomia*. This is its generally accepted denomination; and it is always deemed a felicity, in the construction of the nomenclature, when no imperious necessity requires an accepted denomination to be discarded. It is elementary to all the succeeding sciences in this order, and if it were not so, it would not belong here; that is, if it should not be regarded in reference to its ultimate application and use, it would be mere natural history. As such indeed the French divisions have ranked it.

458. The second epistemia.

The second science, in the order of iatrica, like the second science in the class of mathematica, is not so fortunate as its immediate predecessor. It cannot sustain the rigour of the laws which it is destined to encounter; and the received name must perish. Perhaps in the whole received nomenclature of the sciences there is no term which is entitled to so little countenance as that of *physiology*. It might be attached to almost any other science, as well as to this in particular; or, at least, to a number of others. It might, with greater propriety, designate a great class of sciences than a specific science. In this sense Dr. Campbell, indeed, actually uses the term. In fact it would not be one of the worst terms to denote all science in general. The name

has frequently been complained of; but I do not know of any direct attempt to change it, and am not apprized of any substitute which has been contemplated. The name which will be here proposed has given universal satisfaction. As soon as it has been suggested, every mind, without any exception, and without any hesitation, has acquiesced in it. It is the same word which Dr. Darwin has selected for the title of his work. The name which has been adopted to designate this science is that of, *zoönomia*. From the elements of which it is composed it signifies *the law of life;* and by that exquisite refinement, of which few languages, and indeed none, present such numerous examples as the Greek, it approximates still closer to its intended subject, and does not import the *law of life* in general, but the *law of animal life* in particular. The name expresses the precise distinction between the present science, and the preceding. Its etymology might be the subject of dubiety, but it may be readily dissipated. As ζωον signifies an animal, and νομος imports law, the term, it might be said, literally denotes the *law of animals*, and not the *law of life*. This ratiocination would be irresistible in any modern language; but it does not hold in the Greek. The term for animal, as well in Latin, as in Greek, is a substantive derived from an adjective; and that adjective, in Latin, is itself derived from another substantive, and, in Greek, from a particular verb. The radix of the term *zoönomia*, as here used, is the Greek adjective, ζωος, vivus, *alive; alive with animal life.* It has been heretofore observed, that wherever

there is action there must be a law of action, and that the term νομος may, in such cases, be advantageously combined; for, generally speaking, our knowledge can seldom reach higher than the cognizance of the law. The *reason of the law* belongs to a higher grade of intellect than the human, if such a grade of intellect may be supposed in the constitution of the universe; and if not, the little reason that we have is perfectly bewildered, and scarcely worth cultivating. The term *zoönomia*, therefore, expresses *the laws of action peculiar to animal life.* The question would still remain open, whether anatomia, and zoönomia, should be condensed into one science; or should constitute two. Haller, of Switzerland; whose medical authority is so justly high; considered anatomy and physiology as but one and the same science. If they should be considered as one; the same name, *zoönomia*, would include both anatomy and physiology.

459. The third epistemia.

The third science, in the order of iatrica, is what is generally denominated *the materia medica.* It seems never to have had a single name; unless pharmacy may be supposed to have once comprehended it. A literal translation into Greek of the term *materia medica* would make, under every modification, terms rather barbarous. They will all be found in the synonymic table. In didascalic medicine a radix has been used which is deemed preferable. It is that of θεραπεια. A variety of terms, founded on the same radix, will be found in the synonymic table, but that of, *therapeutria;* from, θεραπευτρια, cultrix; is presented

in the tables of nomenclature. Let not the *pharmacopœist*, the *pharmacologist*, or the *pharmacopolist*, be alarmed. They are not neglected in the consideration of the *arts*. It has not been observed that a direct argument has ever been used in favour of placing physiology as a part of natural history; though such, it has been directly contended, is the rank of anatomy. With much more propriety might the present science be considered as a portion of natural history. As with respect to anatomy, it is its purpose, which rescues it. The objects might exist in nature, independently of man; but their applicability to the curation of disease depends on *his* existence, *his* knowledge, and *his* power.

460. The fourth epistemia.

The fourth science, in the order of iatrica, is denominated, *anthropiatria*. It signifies the application of the knowledge deduced in the preceding sciences to the cure of human diseases.

461. The fifth epistemia.

The Cullenian classification would include the succeeding science in anthropiatria. Surgery is now more frequently regarded as distinct; and if so, its received name, like the terms of geömetria, and mathematica, is liable to objection, but derives strong claims from its mere reception. Though there are many other *operations of the human hand*, which the term imports, yet the distinctive name of, *chirurgia*, is retained.

462. The sixth

The obstetric art would again be considered as, strictly speaking, a part of chirurgia. As a

distinct science, it is, however, presented; and with a distinct name. epistemia.

463. The seventh and eighth epistemias.

The term, *zoötomia*, is the best which occurs for what has so frequently been called comparative anatomy, though liable to objections which the English scholar will deem more formidable than the French; and the veterinary art, or the application of medical science to the cure of the diseases of animals, inferior to man, in general, is reduced into a science, under the appellation of, *zöiätria*.

464. The second order.

The second exercise of the power of man over matter is over that which is extrinsic to his own body, and unanimated. The name selected for this order is that of, *œconomica*. It comprehends five epistemias.

465. The first epistemia.

The first application of his powers, over extrinsic matter, made by man, is to answer the purposes of his own subsistence; and of these the principal instrument is agriculture. The late president of the United States suggested to me, as the name here to be used, *agronomia*. I found, however, that that term was used to signify a certain sort of rural jurisprudence, which prevailed among the ancients, and was exclusively applied to country affairs; and which was entirely distinct from that applied to town affairs. It does not appear to have been used, by the ancient writers, to denote agriculture. The term which has been adopted would be entirely unexceptionable, being purely, inclusively even of

the termination, a Greek word, and used in this exact sense; but it has been employed, both in the eastern, and in the western hemisphere, to denominate a particular country. Here the laws of the orthoëpist must be conformed to. In such words as George, Georgic, Georgia, the name of a country, the custom has become irresistible of consolidating the two first vowels; while the other words of geömetry, geögraphy, geömancer, and their derivatives, according to Mr. Walker, require the separate enunciation of the two first vowels. To this latter class must appertain the word introduced here; and, in correct printing, it ought to be distinguished by the diæresis. The name adopted for agriculture, from the Greek term, γεωργια, is, *geörgia.*

466. The second epistemia.

The manufacture of the products obtained from agriculture constitutes the basis of the succeeding epistemia. The name adopted is that of *chirotechnia.* They are arts depending on *the human hand;* from which word, χειρ, manus, and, τεχνη, ars, an art, the term is composed.

467. The third epistemia.

Those arts which do not depend simply on the human hand; but require the intervention of taste, genius, skill, a sense of beauty; are placed immediately after the arts which are regarded principally for their utility. The name selected for this epistemia is that of, *callitechnia;* derived from one of the former terms, and, καλλος, pulchritudo, beauty. What have been called the fine arts; and which have occasioned such infinite perplexity to those who have been en-

gaged in the classification of human knowledge; would fall into this place, in this system; but, instead of the few which have been hitherto introduced, they would consist of a great many. Naval architecture has not been admitted to an equality with, what has been absurdly enough stiled, *civil architecture.* Engraving has obtained admission; but typography has not been equally honoured. Every art, or calling, or profession, which requires extraordinary learning, science, skill, virtue, opulence, taste; would here obtain admission. I make, in the subdivision of the first of these two epistemias, upwards of twenty useful arts; and the number of the fine arts is not much less. The art of *education* is the first of the latter.

It will be proper in this place to explain, for another equally commodious is not likely soon to occur, an intimation given in a previous part of this discussion. It has been heretofore mentioned that, in the subordinate nomenclature, the termination, *logia*, has not been invariably used in all the epistemias. The epistemia of, *anthropoglossia*, and the two present epistemias of, *chirotechnia*, and *callitechnia;* afford examples of this departure. In the whole, the general idea attached to the base of the epistemia is conceived to be fully expressed in the first term which enters into the composition of the name. The terminations used, in the subdivision of the epistemia, are *glossia* and *technia.* The termination, *glossia*, combined with a name, indicates a particular language. Thus *Hebræoglossia* denotes the He-

brew language. The termination, *technia*, combined with a radical, indicates a particular art; and the radical shews the material, or the material of chief value, on which the art is employed; such as flax, wool, silk, iron, stone, wood, in cases where that distinction is practicable; and, in other cases, in some other equally expressive mode. *Linotechnia;* as an example, from λινον, linum, flax; would denote the *manufacture of linen.* It was once thought to restrict the termination, *technia*, to the fine or superior arts only; and to employ the termination, *pœia*, from, ποιια, *factura*, the making of a thing, for the subordinate or merely useful arts. In this case the general term for manufactures would have been, *chiropœia;* a literal translation of the name. It has been eventually, and, at least for the present, preferred, to adopt the course which has been first explained.

468. The fourth epistemia.

The interchange of the products of agriculture, of manufactures, and of the fine arts, gives rise to the succeeding epistemia; that founded on commerce. The term selected is, *emporia;* from, εμποξεια, mercatura, the trade of merchandize. It is liable to some objections, but Dr. Alexander, of Princeton, and Professor Lindsley, give it a decided preference to all which were presented; and their authority is too valuable to entitle it to any other than the highest respect.

469. The fifth epistemia.

For the fifth and last epistemia, that of political economy and finance, the term which has been selected is, *politœcia;* from πολις, status, a political community, and οικος, domus, a house,

or a home, or a family, or the occupations of peace as distinguished from those of war.

The third exercise of anthropic power is over mind, and the order is denominated, *ethica.* It comprehends four epistemias. 470. The third order.

The first epistemia, in the order of ethica, has its base in *the exercise of the power of man over his own mind.* The name selected for this epistemia is that of, *ethosophia;* from ηθος, mos, morals, and σοφια, sapientia, wisdom, importing *moral wisdom;* and containing what has sometimes been termed, *moral philosophy proper.* 471. The first epistemia.

The second epistemia, in the order of ethica, has its base in the exercise of the power of man over the minds of other men; in what may be called merely social relation, as distinguished from political society, perfectly raised. They are the *powers of society* exercised over *individuals;* sometimes rudely indeed, but always with a direct tendency to a good result, and sometimes with a refinement almost superstitious, and even injurious. Moral philosophy inculcates on the individual mind that debts *ought* to be paid, contracts fulfilled; and a variety of other duties performed. Jurisprudence proper, law, the administration of justice, interposes; and *coerces* the performance of certain duties, or redresses the violation of them. The term selected for the radix of this epistemia is that of, θεμις, θεμιστος, or θεμιδος, lex, law or positive institution; and the name 472. The second epistemia.

becomes, *themistia.* There are a variety of criticisms on this particular radical, as the most proper among all others in the Greek language to denominate this particular science; which are spared, at this stage of the discussion.

473. The third epistemia.

The powers of man, as exercised in the form of perfect political society, constitute the base of the succeeding epistemia. The late president of the United States proposed to me the Greek radix, αρχεια, alone, but I have thought that of, πολις, might not improperly be combined; thus making the term, *politarchia*, for the name of the science or epistemia which relates to political government. Mr. Jefferson, at the same time, communicated the objections which might be urged, in the subdivision of the subject, to the adoption of the term, *parastatic;* to denote *the American principle of government*, when contrasted with the forms known in Europe, of monarchical, aristocratical, and purely democratical. The distinction exists in fact; and the recognition of it in language, would abridge discussion. The Greek term for, *representative*, would, at first view, present a proper radix; but the Greek writers, he observed, never use the word in the sense which would be here intended.

474. The fourth epistemia.

The law of nations is the fourth and last science, or epistemia, in the order of ethica. There has not been found the least dubiety respecting its place or name. The term, *ethnonomia*, has appeared universally satisfactory.

475. The fourth order.

The fourth and last order, in the class of sciences founded on human power, has its base on the application of the powers of man, in the political stage of society, in relation to both mind and matter, to the *coercion of nations*.

No subject, in proportion to its importance, has been so much neglected as military science. So far from being well arranged; in which respect it would only be on a footing with other respectable departments of human knowledge; it has only recently been contemplated in a scientific view. At first it was regarded merely as a *trade*, and was afterwards advanced to the dignity of an *art*. The finest scientific views which have been taken of war are those of one of its brightest ornaments; and are entirely recent. The principal glory of General Bulow was not the victory of Waterloo. He has expired, while this discussion has been on its progress; and without the consciousness of the usefulness with which his literary productions are likely to be attended. The opinions of General Bulow are entitled to the highest attention. He is the only truly philosophic soldier the world has ever produced. He is a friend to humanity, a friend to liberty, and a friend to morals.

476. Sentiments of General Bulow.

General Bulow divides military science into four parts, and makes a partial attempt at nomenclature. He institutes a contrast between what he names *strategics*, and *tactics*. He introduces definitions of both. *Strategics* is the science of the movements, in war, of armies, out of

the visual circle of each other; or out of cannon reach. *Tactics*, is the science of the movements made, in war, within sight of the enemy; and within reach of his artillery. He afterwards complains of the unsettled state in which the characteristics of these two sciences yet remain; and of its being, logically, necessary to include in tactics what more properly appertains to strategics. Strategics include two principal parts; *marching*, and *encamping*. Tactics comprize two likewise; *the forming the order of battle*, and *battles*, or *attack* and *defence*. These four parts taken as a whole constitute the art of war. The attack and defence of fortified towns make a part of tactics. So little was even the attempt to arrange military knowledge, scientifically, relished by military men, that the Chevalier de Martemont, the commentator on General Bulow's discussion, "on the spirit of the modern system of war," cannot restrain his impatience, on the perusal of this short chapter. The chevalier has no doubt that every other reader will find it as long as he has found it. The author, he thinks, might have abridged it, without lessening the merit of his work.

General Bulow first draws the distinctions between an *art*, and a *science;* and then proceeds to offer his peculiar and original sentiments, which are not less important in themselves than ably supported. He contends that the perfecting of the military sciences will have a tendency to promote large, established, and permanent empires, in lieu of inconsiderable and transitory

states; and that it is a direct step to, and will inevitably terminate in, *a universal peace.* War, he observes, will be no longer called an *art*, but a *science;* for art is the application of science. Science is in the mind only. Art descends from the mind into the sphere of activity. Art is all that can be *done*, whether good or bad. These qualities accord not with science. We *know* it, or we do not *know* it. We say of a science that it is true or false, of an art that it is good or bad. The more the sphere of the *art* of war shall be contracted, the more will the *science* of war be extended. The *art* itself will be a *science*, or will be lost in it. The perfection of the *science* of war tends to the production of general and perpetual peace. Morality gains by the ceasing of war; that pest of the virtues. War is not only the science of murder, but the science of robbery. The passion for military glory will be extinguished. Uninterrupted peace will considerably increase the physical welfare of man. War is the most voracious consumer of the elements of existence. The number of producing agents being diminished, the quantity of produce must necessarily be so. It is an unfounded objection that from a continual peace we should have to dread an excessive population. The more men there are, the more productions. In a depopulated country one runs a risk of starving from the want of consumers. The blessing of perpetual peace would put an end to the error that the science of war; that science of robbery, rather than of murder; leads, more than every other, to

immortal glory. A more general knowledge of its principles would contribute to dispel this delusion. The estimation of this art, and of those who profess it, will fall rapidly.

These sentiments of General Bulow, expressed with even more than a soldierly frankness, are unquestionably scientifically correct, though transient exceptions might occur to particular modes of phraseology; and it was from a conviction of the importance of military science to the interests of philanthropy, of political freedom, and of general knowledge, that, long before the opinions of General Bulow were known, I had attempted an arrangement of it. A train of dreadful events, in my own country, and operating with tenfold severity in my own vicinity; of which I was a most miserable spectator, and in which the dictates of humanity compelled me to sustain a considerable part; did not lessen the conviction of the importance of military science, in a free country. I beheld my brave countrymen, ignorantly led, and ignorantly commanded; and subjected to a torture, and to a death, of the cruelty of which the boldest imagination is not capable of forming a conception; or, otherwise, sold, like beasts in a market-place, or carried into an ignominious captivity. General Bulow forms an entirely erroneous view of the American military character, but introduces an interesting fact relative to the American revolutionary war. What renders this war, he observes, remarkable, in a military point of view, is that the first use of *tirailleurs* may be dated from that

period; and that the American soldiery were the first troops employed in that manner.

The name which had been selected for the order comprizing the military sciences is that of, *polemitactica;* from, πολεμος, bellum, war, and the adjective corresponding to, ταξις, ordo, order. I had dilated the order, like that of iatrica, into twenty-one epistemias, with appropriate denominations of Grecian etymology; and, afterwards, contracted them into eight. In this order the epistemias have all a uniform termination, that of, *taxia*, corresponding with the generic term; in the same manner as the preceding terminations of, *metria*, *gnosia*, *sophia*, correspond to the respective generic terms of, *geometrica*, *physiognostica*, and *physiosophica*. In some of the other orders I have not been able to impart this beauty, if it is deemed such, to the respective epistemias; that of importing, by the penultimate syllable of their very termination, the order to which they belong. The class of anthropoglossica appears entirely to reject it. If indeed, at a future day, logic should be abolished, or consolidated with rhetoric, that order would readily admit it; by such terms as, *dialectica*, *dialexia;* or, *rhetorica*, *rhetoria*. The order arithmetica rejects it, and that of iatrica only partially admits it; while those of uranica, and chymica, would, and do, readily conform. I have made no experiment on that of œconomica; but that of ethica has been fairly tried. The terms presented in the table of nomenclature have been preferred, by most minds, when contrasted with those of;

477. The name of the order.

ethonomica, *ethonomia*, *dicæonomia*, *archinomia*, and others, which are found in the synonymic table. I have yielded it with reluctance; but a cordial approbation has been uniformly attached to the terms constructed with that peculiarity in relation to the military sciences.

The arrangement of the military sciences has, however, been attacked, on another ground, and that from two quarters. It is alleged, that, although so much reduced, they are still not reduced enough. Dr. Miller, of Princeton, would by no means be satisfied that the staff department, or the *commissariat*, should take rank as a specific science, in the military order; while the same honour should be refused to meteorology and hydrology, whose claims he eloquently advocated, in the more pacific walk of natural history; nor would Mr. Bleecker, of New-York, make two distinct sciences of the infantry and of the cavalry service.

I have been obliged to acknowledge the force of these objections; and had, therefore, determined on subjecting, to a still farther reduction, the military sciences. Since I was honoured with their remarks, I have been engaged in such incessant action, that I have not had leisure to enter into a complete review of the military sciences; and, at present, to dwell longer on this question, would be to violate one of the finest military maxims, and, by protracted deliberation, to suffer the period of performance to pass by. I have thought I should err less in presenting

the military sciences, in the manner in which I had them, accompanied with this acknowledgment; than to hazard an essential deterioration of those important branches of knowledge, by a precipitate and inconsiderate reduction. As in medicine, there are many minds, of much superior information; which, when brought to bear upon the subject, would quickly remove all hesitation.

478. The epistemias of the fourth order.

The eight sciences in the order of polemitactica, are the following; *pezotaxia*, from, πεζος, the foot soldiery, the infantry service; *hippotaxia*, from, ιππος, the horse soldiery, the cavalry service; *barytotaxia*, from, βαρυς, gravis, heavy, the artillery service; *sthenotaxia*, from, σθενος, robur, strength, fortification; *erismatotaxia*, from, ερεισμα, fulcimen, a prop or staff, the staff department, or the commissariat; *stratotaxia*, from, στρατος, exercitus, an army, the formation and regulation of armies; *polemitaxia*, the principal science, giving the name of the order, and to which the preceding are only elementary, the art of war, generalship, battles; and *nautotaxia*, naval tactics. I am not fully satisfied respecting *sthenotaxia;* and respecting *barytotaxia* it may be observed, that modern artillery not only supplies the place of the heavy machinery of the ancients; but that having attempted to obtain the term used for gun-powder, which was unknown to the ancient Greeks, among their modern descendants; through the medium of certain Greek ships which were at New-York, during the recent war between the United States and Great

Britain; I understood it to be βαρυτον. This circumstance, if it had been founded in correct information, and if the cause of it should not be misapprehended, would fortify the premises which had been previously assumed. Dr. Mitchill, however, of New-York, states a different term as the modern Greek for gunpowder, which I have forgotten; but I have no doubt of his superior accuracy.

479. The third class.

The four orders of, iatrica, œconomica, ethica, and polemitactica, exhaust the class, anthropodynamica, or that of sciences founded on human power, or *the anthropic dynamis*, as their common base; being the second class of the province, hylennœica, in the first table. There remains but one other class in this province.

The third class in the province of hylennœica is named, *diegetica*. The term is derived from the Greek word, διηγησις, narratio, narration, or commemoration. The idea of the base of this class may perhaps be thus expressed; it is the application of the first class of this province, or of those departments of human knowledge which are founded on the faculty of human speech, to the second class in this province, or of those departments of human knowledge which have their base in human power; or, in a more succinct phraseology, its base is *the application of human language to human power.*

480. Sentiments of

The introduction of the term, *diegetica*, affords an opportunity for the explanation of a part of

the process, which has been pursued, in the construction of the nomenclature. In presenting the table of nomenclature to a particular gentleman, in order to obtain the benefit of his criticism on the terms, those terms were used which were approved by the gentleman with whom the last conference was had; or which had been but recently suggested, and not those which were most approved by the author of the system. A right was reserved, when the system should be laid before the public, to make a definitive selection from all which had been under consideration. Lest, however, the weakness of the author of the system should lead him to the adoption of a less appropriate term, when one more eligible had been actually proposed, all the terms which have been proposed; all those which have ever been used, so far as they are known; all those which have suggested themselves to the mind of the author of the system; all those which have been suggested to him, by other persons, stating, in such case, the name of the person; and all those which, though having suggested themselves to the mind of the author of the system, have not been adopted by him, but have notwithstanding been decidedly preferred by some other person, stating also, in such case, the name of the person; have been collected into synonymic tables. Thus, if, in the eventual selection of a name, an erroneous judgment has been made; the means of correcting the error are presented. The same materials out of which the selection of the author was made are put into the possession of others;

the reverend Cave Jones.

and means indicated by which the store of materials may be rendered still more rich.

When, in the course of this process, the system was submitted to the reverend Cave Jones, of the city of New-York, in the place of the present radix was presented that of πραγμα, factum, a thing done or transacted, an event, an affair; and the name of the class thus became, *pragmatica.* The reverend Mr. Jones interested himself so much, in the proposed enterprize, that, after a polite and patient attention to its developements, he attentively, coolly, and perseveringly examined; not for a few minutes, or a few hours, or a few days; but for a succession of weeks; every particular division, and every particular term of the nomenclature. The result was that his convictions became perfect and established. He did not attack any of the divisions. They appeared conclusively satisfactory. But he severely attacked two of the terms in the nomenclature. Of these, that of *pragmatica* was one. The substitute which obtained his approbation was that of, *diegematica;* and, with that term, the tables were afterwards presented. This was the first actual proof, founded on experience, of the solidity of the system. A mind of distinguished erudition, of general information, and forming, in every respect, a fair and competent judge, took an interest in the subject; patiently and deliberately pursued the train of investigation to its ultimate limits; and gave as the result a cordial, an ardent, and a firm approbation of the entire system; with the exception of only two terms

in the nomenclature, and for these, substitutes, which were deemed satisfactory, could be proposed. Dr. Reid observes, that society in judgment, of those who are esteemed fair and competent judges, has effects very similar to those of civil society. It gives strength and courage to every individual. It removes that timidity, which is as naturally the companion of solitary judgment, as of a solitary man, in the state of nature. From this period I have lost only one single mind, where adequate attention has been bestowed; and that was not on the ground of imperfections in the system, but on the necessity or utility of any system whatever.

The term, *diegetica*, has however, eventually, been preferred to that of, *diegematica;* but, whether properly, still remains extremely dubious. Diegematica is pure Greek, and has been used by writers. Diegetica has not been used by Greek writers, at least to my knowledge. Both διηγημα, and διηγησις, signify *narration;* but I imagine there is a nicety of distinction between them, which cannot be exemplified in the English language. The former, it is believed, would import the thing narrated; rather than the act or fact of narrating it. Thus, by the analogy of the Greek language, κοσμημα might be translated *an ornament*, but κοσμησις, would import *decoration.* The term diegetica, though not found, is notwithstanding regularly formed, and according to the strict analogy of the language; as are instanced in the correlative terms of, αριθμησις, αριθμετικος; κοσμησις, κοσμετικος.

481. The orders of the third class.

The class, *diegetica*, is divided into two orders; of which one is elementary to the other. The first order comprehends the two received sciences of, chronology, and geögraphy. Its name will be presently stated. The second order is named, *historica;* from the principal epistemia in it, *historia.*

482. The epistemias of the first order.

It has been, at a more early stage of the discussion observed, that logic presented one of the instances of *a double science;* and the confusion which was thus generated has been, in some degree, exposed. It is proper, now, to remark that the received science of *geögraphy*, is another instance of the same sort; and that this is even *a treble science.* It includes three distinct subjects; the earth, astronomically considered; the earth, considered in relation to natural history; and the earth, considered as partitioned among certain political societies, occupying and inhabiting its surface. These three several subjects, in this system, are referred to their proper places; the first, to astronomia; the second, to geögnosia; and the third, filling the present position. Sufficient explanations have been made respecting the terminations, which happen to be attached to the words chronology and geögraphy; but the radix of the latter term requires some detail. At first, this department of knowledge received, in European science, the name cosmographia; and how geögraphia came, eventually, to supersede cosmographia has not been observed. The reason probably was, that as a knowledge of the Greek language was further cultivated, it was perceived,

that the term, κοσμος, was used, by the classical writers, to express, not merely the globe or matter of the earth alone; but the whole constitution of the universe. It is expressly so used by Aristotle. The literal signification of the term is that of order, symmetry, beauty; and hence it was applied to the whole universe, as one of the most perfect examples of those qualities. In one of its senses, it denotes the *ornaments of female dress* alone. It is frequently taken for the world of mankind at large, and sometimes for the wicked, and impious, or unbelieving world, more particularly. It is used, in both the latter senses, in the New Testament; and the frequency with which the term is there used, to signify the whole race of human beings upon this earth, has induced me to adopt it, as a radix of the name of this science. Great diversity of sentiment prevails respecting the authority of radices from this source. The reverend Dr. Wilson, and Mr. Jefferson, consider the classical authorities by far the best. The reverend Mr. Wylie considers the New Testament as one of the best authorities; because it affords the instances of a popular and colloquial use of words. In such expressions as, *the world loveth its own*, *the children of this world are wiser than the children of light*, and others; the word used is, κοσμος. I have combined this word with the other, signifying the world or earth in another sense, and thus it appears that the term expresses, with precision, the intended idea; *the world of men*, *the human world*, *as exhibited upon this earth*. The terms selected are; *chroniotetia*, and *geöcosmia*.

The name of the order is taken from the latter as the principal science; and becomes, *geöcosmica.* The term chroniotetia is derived from, χρονιοτης, χρονιοτητος; diuturnitas, diuturnity, lastingness of duration.

483. The episteмias of the second order.

There is no term, in the whole nomenclature, which to my own eye, and to my own ear, is more repulsive and averting than that of, *hodœporia;* to signify voyages and travels; and yet there is none which is more classical, or has better authority. The terms, of which it is composed, fully and exactly express its meaning. Such accuracy is even attained, that the terms, as used by the ancient writers, implied travelling in four different modes; on foot, on horseback, in a carriage, and in a ship, or other vessel; and are so used in Xenophon, and the New Testament. Hesychius gives the word in full, and exactly in this state, ὁδοιπορια; under the word πορεια, in the Badensian edition of 1521. Lambecius uses, hodœporica, for this express purpose.

The term adopted for biography is that of, *biotetia;* from, βιοτης, βιοτητος, vita, life, rather, the manner or method of life; entirely distinct from, ζωη, vita, life, animal life.

It may be observed, in relation to the term, *historia,* that under the word, διζα, Hesychius gives the terms, διηγημα, and, ιστορια, as synonymous; still farther confirming the name proposed, for the entire class of which this is the prin-

cipal epistemia, by the reverend Mr. Jones, of New-York, that of *diegematica.*

The last epistemia, in the class of diegetica, relates to antiquities. The term selected for this department is that of, *archæotetia;* from, αρχαιοτης, αρχαιοτητος, antiquitas, vetustas, antiquity. I had always entertained a doubt whether the proper radical for the name of this science, if it may be so called, ought to be, παλαιος, or, αρχαιος; and, incidentally, stated the doubt to the reverend Dr. Mason, of New-York. Before his energetic criticism every vestige of dubiety was dissipated, like the matinal mist by the orient sun; and I became satisfied that the selection made of, αρχαιος, was the proper one.

484. The third province.

This closes the province of, hylennœica; or the consideration of matter in union with mind. It remains to proceed to the subject of *mind.*

Through the preceding province; consisting of thirty-nine epistemias, and some of them the most extensive in the whole range of human knowledge; it was found convenient, in order to abbreviate the discussion, as well as to afford a variety in the manner, to deduce the several classes, orders, and specific sciences, synthetically. The province of ennœica being less discursive, the analytic course will be resumed.

Mind may be regarded in five points of view; first, as presented in beings inferior to man; se-

condly, as presented in man; thirdly, as presented in beings, existing, or supposed to exist, superior to the human mind, and inferior to deity; fourthly, as existing, or supposed to exist, in deity; and lastly, as regards the relationship existing, or supposed to exist, between the divine mind and the human mind.

485. The intellect of animals.

With respect to the first, the minds of animals inferior to man, a doubt may be entertained whether they ought to constitute the base of a particular science. They have never, heretofore, been thus elevated. It might be urged, that we can know nothing respecting the minds of animals but by a comparison of some few facts with the action of our own intellect. The consideration, therefore, of the intellect of inferior animals, it might be said, may well form an appendage, a supplemental chapter, or section to the science of the human mind; without itself forming a specific science. The intellect of the inferior animated beings of this earth is to the anthropic intellect, what comparative anatomy, and the veterinary art, are to the science of medicine, when their bodies are the subjects of investigation.

On the other hand, it may be contended that the proper mode of investigating the subject of *mind*, is to begin, at the very lowest point, where it makes its appearance, in the scale of nature; to trace it, from the rudiments of irritability and sensation, to clear and perfect volition; to reminiscence, imagination, and ratiocination, in the

highest orders of animals; and those approaching nearest to the vigour and perfection of the anthropic intellect.

On presenting this question to the late Dr. Barton, the professor of natural history in the university of Pennsylvania, he gave it to me, as his opinion, that the minds of animated beings on this globe, inferior to man, in the scale of existence, ought to constitute a separate science. He observed, that this subject had been much less attended to than it merited. It would yield, he thought, a rich harvest to the cultivator of the field. It was a region, in a great measure, unexplored; and in which, he had no doubt, there was a great deal, that had not been observed. He believed, that he had himself observed and collected much that was original; and that he had it in contemplation formally to present the results to the world, if life, and health, and leisure, would allow. Influenced much by the arguments of Dr. Barton, whose researches, I am persuaded, would have exhibited an invaluable mass of facts; actuated still by a hope that some other naturalist, of distinguished genius, will become inspired with the same views; and indulging the expectation that Professor Stewart, of Scotland, will improve all the facts already known, on this interesting and curious subject; I have allotted a place for the intellect of animals, inferior to man, as a separate science. The name is, *zoönœia.* The radicals of which it is composed are, ζωον, animal, a living creature; and, νοια, mens, mind.

486. The human mind.

The name selected to denote the science or epistemia of the human intellect is, *anthroponœia;* of which both the radicals have been already furnished.

These two epistemias exhaust the subject of mind, as found in beings that possess it in a material vehicle. They are therefore connected in an order. The Greek language affords a single word, which expresses these two ideas, the existence of mind, and its connexion with a material vehicle; that of ψυχη, anima, a soul, an animal soul. St. Paul recognizes this application of the radix, with great precision. The name of the order thus becomes, *psychica.*

487. The spiritual world.

A still greater degree of doubt has been entertained whether beings superior to the human mind, and inferior to the divine mind, ought to constitute the base of a particular science. On the one hand, it may be said, that we know nothing respecting such beings, distinct from certain systems of mythology, and certain systems of religion, in which their existence and nature are inculcated; and that the consideration of them, therefore, properly belongs to those several mythologies, or religions, and forms a part of them. Of this sentiment I found Mr. Jay, Bishop Hobart, Mr. Jefferson, the reverend Mr. Jones, and Dr. Mitchill.

On the other hand, it has been contended, that entirely independent of revelation; and totally unconnected with every religion, or mytho-

logy; the progress of uncultivated, and of cultivated intellect, have alike conducted to the same result. Man, at all times, in every state, believes in such beings; and reason, and the analogy of nature, lead the most refined and cultivated minds to the same belief. We actually perceive the descending scale of intellectual being; and must, almost necessarily, from that circumstance alone, and merely from the light of nature, believe in an ascending scale. However little is known, or however little, in our present state, may yet become known, yet there is evidently a field marked out; and, in a general map of human knowledge, that field must not be neglected. Of this sentiment were the reverend Dr. Alexander, professor of didactic and polemic theology in the theological seminary at Princeton; Dr. Green; and Dr. Miller. The reverend Ezra Stiles Ely, of Philadelphia, would retain what I had called, *pneumatia;* from πνευμα, spiritus, a spiritual existence; as a specific science, but would place it in the same order with the two preceding sciences, and not with that relating to the Deity, which should occupy the succeeding order alone.

The ancients founded an argument in favour of the existence of a chain of spiritual being, down to man, on what they termed, the *dignity of deity*. What, said they, shall the Persian king be capable, from Susa, and from Ecbatana, of administering far and wide a most diffusive government, through the multitude of his minis-

ters and servants; and shall divine majesty be supposed unprovided with millions of messengers and ministers to expedite his will, and aid him in the vast administration and government of a universe? The Jewish rabbinical writers divide the world of spiritual beings into tribes or cohorts, ascertain the number in each tribe, and the sum total, give the names of the tribes, and the principles on which the calculations of their numbers are made; a very curious account of which is exhibited in the work of Antony Le Grand, in the sixth article of the third part, entitled *concerning the number, distinction, and rank of the angels.*

I have inserted, *pneumatia,* in its proper place, in the first table, in order to shew its position; but, in the second table, when consecutive number comes to be applied, I have omitted it, because I believe that every thing essential, which appertains to it, is a part of religion.

488. The Divine Being.

The order, *pneumatica,* stands, therefore, with but a single epistemia in it, relating to the Supreme Being. The name selected is that of, *theotetia;* from θεοτης, θεοτητος, deitas, deity, godhead. In the phraseology of Plato the term would have been, theœtetia; from θεοιτητος. Dr. Mason suggested to me *theiotetia;* from θειοτης, divinitas, the divine majesty. St. Paul uses, θειον, in his speech, at the Areopagus, in Athens, as reported by Luke, to signify deity; θειοτης, in his epistle to the Romans; and, θεοτης, in that comprehensive

and energetic compend of sublime ethics, his epistle to the Colossians. The latter radix appears to be the most directly applicable.

489. Religion.

The relationship between the human mind and the divine mind gives origin to four epistemias.

490. Gentile religions.

The first of these is founded on heathen or gentile systems of worship in general. The name selected is that of, *ethnilatria*. The radicals of which it is composed are the substantive, λατρεια, cultus, religiosus, religious worship; and the adjective, εθνικος, gentilis, gentile, foreign to the Christian faith, with its termination rejected. The term, *ethnolatria*, would perhaps be ambiguous, and imply rather the worship of a nation, than a gentile system of worship; and this manner of combining the adjective appears to be attended with some advantages, and particularly that of brevity. The term, *mytholatria*, from μυθος, fabula, fable, had been under investigation; but it was considered, by some clerical gentlemen, as liable to the objection that it might appear disrespectful to such minds as, though cultivating science, may happen to believe in some religion different from the Christian; and as assuming, and taking for granted, that which ought to be subjected to proof, that the religious system alluded to was fabulous. The other term has, therefore, been generally preferred. It is however nothing other than simple truth that there is very little science, among mankind, out of Christian communities.

It was a question, respecting which in this system, it was expected a diversity of sentiment would obtain, whether the ancient Jewish religion and the Christian ought to form but one epistemia, or should form two; but actual experience has not realized the anticipation. The uniform opinion has been that the two systems ought to form two separate epistemias; but a difference of impression has not only been met, with respect to the name of one of them, but also in relation to two other points, which were not anticipated.

491. The Jewish religion.

The name selected for the epistemia founded on the Jewish religion is that of, *hebræosebia;* from ἑβραιος, Hebræus, Hebrew; and, σεβεια, religio, religion. Dr. Wilson thinks that if the name of the patriarch Heber should be regarded as the radix, in this instance, an ambiguity might arise in relation to the Arabians; who are, equally with the Jews, the descendants of Heber. The Rev. Dr. Janeway, of Philadelphia, suggests whether this ambiguity might not be removed by founding the term on the name Israel, as the radix. The term, *Judæosebia*, would be liable to an ambiguity; on account of its appearing to exclude the Samaritans. The etymology of the term, Hebrew, is a point unsettled among those who have particularly cultivated biblical criticism. Abraham is the first who is directly so called, but whether from the circumstance of descent from Heber, or from that of his having come from the other side of the Euphrates, the original word importing in colloquial use *on the other side;* or even

from the circumstance of language; remains dubious. The term, *Hebrew*, however, appears sufficiently general to comprehend the whole Jewish religion and literature; without an essential difficulty, in relation to the Arabians. It has been imagined that there is a grade of difference between the two radices of, λατρεια, and σεβεια, as respects the dignity of the two words; and that it is in favour of, σεβεια. Perhaps the impression is owing to an association of ideas, on account of the word, λατρεια, having been used in the composition of the term, idolatry. Certain it is that the word, λατρεια, was originally used in as respectable a sense as any other word signifying worship. Gregory Nazianzen calls expressly a Christian, μυθολατρις; from μυθος, verbum, *a worshipper of the word.*

492. The Christian religion.

The name selected, in this system, for the epistemia, founded on the Christian religion, has given universal satisfaction. It is that of *evangelia;* from, ευαγγελιον, lætum nuntium, glad tidings.

493. A sentiment of the bishop of New-York;

The right reverend bishop Hobart, of New-York, recommended to me particularly to consider whether the patriarchal religion ought not to be made a separate epistemia; distinct from the Jewish religion, and from the Christian. The patriarchal religion would necessarily meet, in this system, a consideration at the head of the order, on account of its being chronologically anterior to all the gentile systems of worship; and subsequently a more close attention as the foun-

dation both of the Jewish and of the Christian religion. The whole order it will be perceived in fact forms a unit, and the patriarchal religion can never be lost sight of in any part of it; while the peculiarities appertaining to it are too few, in their detail, to require a particular science.

494. and another of the bishop of Pennsylvania.

The right reverend bishop White, of Philadelphia, entertained the opinion that the Mahometan religion should form a distinct epistemia. It was more closely connected with the Christian than was, at first view, apprehended; and ought not to be confounded with heathen religions in general. In this system it is kept perfectly distinct from other religions, as a branch by itself; without, at the same time, being regarded as forming a complete epistemia. It is the connecting link between gentile systems in general and those founded on the Christian faith.

495. Philosophical opinions on religion.

The last epistemia comprehends philosophical opinions in general; and considering Christianity as one of them. The terms *philosophy*, and *philosopher*, have obtained in modern usage, a sense entirely different from their legitimate import. They are used to denote a disbelief and rejection of Christianity. Mr. Jay entertained the opinion that this use of the terms made an unnecessary sacrifice, on the part of Christianity. It seemed to imply that a belief in Christianity could not be entertained upon philosophical principles; whereas, he imagined, a belief in Chris-

tianity might be entertained, upon principles as purely philosophical, as a belief in any other subject whatever.

496. Philosophical Christianity.

In the same manner, some of the clerical gentlemen, who have been consulted, consider a belief in Christianity precisely in the same point of view as any other belief; that is, *as depending entirely on the evidence.* Philosophical Christianity, and Christian philosopher, are terms which, in their view, import no solecism. There are others, who do not view Christianity in this light; and who believe there can be no such thing as philosophical Christianity. Some diversity of sentiment has also obtained respecting the name, as well as the place, of the last epistemia. In order to elucidate the questions, a few of the opinions will be stated.

497. Diversities of opinion concerning the last science.

The name presented to the reverend Mr. Jones, of New-York, was *acrosophia;* the same name which the Abbe Mango had selected for all human knowledge. It is derived from, ακρος-φος, impensé sapiens, exceedingly wise; importing the summit, or extreme stage, of human learning. This is the second term to which the reverend Mr. Jones was so much opposed. He considered it as spoiling the beauty of the whole system. The objection to it lies in this; that the name, taken in connexion with the place of the epistemia, might imply that, after the consideration of the Christian religion, there was still another system, another portion of human learning, of a superior nature, and of a more correct

and dignified quality. He would, therefore, propose another name for this epistemia, that of, *hagiosophia;* from, ἅγιος, sanctus; and to the last branch of the epistemia he would apply the term, *acrologia*, the summit of human wisdom. The place of the science Mr. Jones would consider as correct. Philosophical opinions ought to be discussed after Christianity, and not before it.

Mr. Jay and Dr. Mitchill were far from considering this change as any improvement; and would prefer the nomenclature as it before stood, with *acrosophia* for the name of the last science; and *hagiologia*, or a philosophical belief in Christianity, as the last branch of it. They do not consider the proposed change as in the least obviating Mr. Jones's objection; nor do they admit the objection itself to be well founded. Dr. Mitchill would change the place of the science. He would place it immediately succeeding ethnilatria. He observes, that there are no new philosophical opinions; and that any that are now entertained are as old as the heathen systems of worship. Mr. Jay, on the contrary, corresponds with Mr. Jones respecting the place of the science; and does not consider the modern philosophical opinions as, by any means, identified with the ancient. Many points, on which the philosophy of the ancients was perfectly afloat, are firmly settled by modern philosophers. The latter are all agreed, and the field of doubt has thus been greatly reduced. Dr. Hobart's opinion corresponded with that of Mr. Jones. He preferred the terms; *hagiosophia*, and *acrologia*.

The reverend Dr. Samuel Miller, professor of ecclesiastical history and church government, in the theological seminary, at Princeton, corresponded in sentiment with Dr. Mitchill. He would place philosophical opinions, on the subject of religion, immediately after the heathen systems of worship. He would not relish the term, hagiosophia. The term, *hagiodogmatia*, would be more acceptable to him. Dr. Mitchill also thought that some term, founded on the Greek word, δογμα, placitum, an opinion, would be the proper appellation in this place. The ancient term was, *dogmatopœia*. The New Testament uses the term, δογμα, repeatedly, to signify a religious rite or ceremony. The reverend Mr. Wylie, of Philadelphia, would have preferred the term, *pseudosophia*, retaining the position; but, eventually, cheerfully and cordially acquiesced in a modification proposed by the right reverend bishop White, of Philadelphia, as did also all the other gentlemen, in Philadelphia, whom there was an opportunity of consulting.

498. Adjusted by the bishop of Pennsylvania.

The proposition, made by the right reverend bishop of Pennsylvania, was to retain the position of this last science; but to found its name on the Greek term, ελευθερος, liber, free. The name which Dr. White suggested was, *eleutherosophia*. The gentlemen who were consulted preferred the contraction of it to, *eleutheria;* and, on this being stated to Dr. White, he did not, in the least, disapprove of the abbreviation. The term has, therefore, been adopted in the table of nomenclature; reserving, for all the others, a place in the syno-

nymic table. The name of the last science; that comprehending philosophical sentiments in general, on the subject of religion, including among them the belief in Christianity; is, *eleutheria;* from the Greek term, ελευθερια, libertas, liberty.

499. The subdivisions of the last epistemia developed.

As the subdivision of this science became a subject of investigation; more so indeed than any other, in connexion with the general arrangement; it may be proper, in relation to it, to depart from the course uniformly adhered to, in other instances, of not entering into the minute explanation of the subordinate divisions of a particular science. The epistemia, or science, embracing philosophical opinions, in general, on the subject of religion, was divided into the four following branches.

500. Atheologia.

First, *atheologia;* the doctrine of atheism; all the arguments which have been used, or where the intolerance of particular countries has prevented the expression of them, the arguments which are supposed to have been deemed cogent, or all which can occur, on close reflection, to one's own mind, in favour of the general principle, that there is no deity; that there is no necessity for the supposition of such a being in the constitution of this universe; that the universe came into its present state of existence by chance, or is self-existent; that what we suppose to be design, if our minds might only be imagined one grade higher in view, is the perfect absence of all design; or, if any exists, that the means used to execute it are less perfect, and

effectual, than would be, with similar powers, even those of a merely human intellect.

Secondly, *thanatologia;* the general doctrine, that if, for the sake of argument, the existence of a deity be admitted or supposed, yet that it is of no consequence to man whether a deity does, or does not, exist; that man has no soul or mind distinct from his body, or surviving it; that human thought or cogitation is merely the result of the organization of the body, and perishes with it. This doctrine, in the modern theological schools, bears the name of, *mortal deism;* one of the most clumsy and awkward of the received scientific terms. 501. Thanatologia.

Thirdly, *calyptologia;* the general doctrine, that admitting, for the sake of argument, the existence of deity, and the immortality of the human soul, yet that there is not, has never been, and cannot be, a revelation from the divine mind to the human mind; that we are left to discover what we can of the constitution of the universe, both mentally and materially considered, by the vigour and perseverance of human intellect, without any direct manifestations whatever from a superior, or from a supreme, being. 502. Calyptologia.

Fourthly, *hagiologia;* the general doctrine, that a deity does, and must, exist; that the human soul is, and must be, immortal; that a revelation from the divine mind to the human mind has actually taken place; that it is manifested in the Christian religion; and that the 503. Hagiologia.

believer in that religion shall not perish, but shall have eternal life, in a state of perfect beatitude.

504. Objection obviated that atheism is no part of religion.

Some too have at first thought that atheism cannot be at all considered in the discussion of religions; while others have imagined that the refutation of such a doctrine, and the extirpation of it from the mind, is the foundation of all piety. Atheists they divide into two classes; atheists, *ab ignorantia*, from the want of knowledge, and atheists, *ab pseudosophia*, from false knowledge. All mankind fall, by nature, into the first class, until the intellect has acquired strength; and the progress of science scarcely leaves a possibility for the existence of the other, so absolute and convincing are the proofs not only of design, but of perfection of design, in the constitution of this universe. The first class must be met, and if the expression be admissible, subdued, at the very outset of the establishment of any religious principles; and the last class, if they exist, not left any tenable fortress.

505. Diversity of sentiment respecting freedom of discussion.

In like manner, the diversity of opinion is not inconsiderable in relation to freedom of discussion. Some are afraid that society will be unhinged by freely investigating every subject; that these points belong to the philosopher, and to the learned, and not to the common mass of mankind; while others boldly contend that opinion is, and ought to be, and indeed necessarily must be, free; that hypocritical sentiments, on any subject, have no value; and that the mind

of the most unlettered human being is as competent to determine these questions as that of the proudest philosopher, and, in fact, less liable to err, and to be led astray.

This developement of the subdivision of an epistemia, in connexion with the zoölogical example, heretofore presented, farther elucidates the subordinate nomenclature.

506. The three orders and single class of the ennœic province.

The name of the order embracing the four epistemias, founded on religious opinions, is that of, *eusebica;* from, ευσεβεια, pietas, religio, piety or religion.

The three orders of, psychica, pneumatica, and eusebica; form the class, *ennœica.* The province has the same name. An ambiguity might appear to arise here, from the identity of name. Some orders contain but one science; but then, there is a difference in the termination. The propriety of distinguishing a class from an order, and a province from a class, by a diversity of termination, has been investigated; and experiments made. No essential utility, and no particular beauty, appear to attend it. One generic termination seems to answer every purpose. If the province, ennœica, contained more than one class; or if the names of provinces differed, in termination, from the names of classes; the repetition of the same name would not have occurred. It appears more correct to retain the name, than to change it, merely for another word

of the same import. As, in the nature of things, an order may contain but one epistemia; so it might happen that, in nature, a class may contain only one order, or a province only one class; and the same, it is believed, is verified in botanical classification.

507. A term for universal science.

A term is wanting to connect the three provinces of, hylica, hylennœica, and ennœica; in the first table. The enquiry will present itself, which of the two terminations this term ought to be invested with? whether it ought to possess the generic or the specific termination? It will be found that the specific termination applies here. All science is a unit; and, when it is considered in that light, resembles any particular science, differing only as the whole differs from the several parts. The term which has been selected is that of, *catholepistemia;* from, καθολος, universalis, universal, and, επιστημη, scientia, science; *universal science.* There is an essential difference between, πας, and any of its compounds; and ὁλος. All the parts of an object, separately, are not the whole; as all the constituent elements of an orange, separately, would not be an orange. The radix, επιστημη, seems to be necessary, from the selection made of it for particular sciences; and the adjective combined with it appears to be the only unexceptionable one which the language presents. The term is objectionable on account of its length; and yet, out of as many as a hundred words, in the synonymic table, none is found which has been gene-

rally preferred; nor is it contended that a better substitute can be obtained for the word epistemia itself.

508. Contrasted with encyclopædia.

The term, catholepistemia, imports directly the reverse of the term, cyclopædia, or encyclopædia. No better term could ever be possibly devised to denote the object intended than that of, *encyclopædia.* The word, παις, signifies, literally a boy. By a figure, it includes the young in general. Thus, παιδεια, comes to signify boyhood, or youth in general; and, by a figure, the instruction appurtenant to the state of boyhood, or youth; and, by a farther enlargement of the figure, all instruction to whatever age it may be appurtenant, all learning. The word, κυκλος, signifies a circle, and thence, κυκλοπαιδεια, comes to denote the circle of learning; and the Greeks used it to import the seven sciences, or liberal arts. The preposition, εν, has an augmentative effect, in composition; and thus, ενκυκλοπαιδεια, signified the circle of learning, on a large, extended, and comprehensive scale. In modern use no term is more expressive than that of *encyclopædia;* importing all human knowledge, literally, *in a circle, without either beginning, or end, and arranged according to the letters of the alphabet.*

The term, *catholepistemia,* is intended, on the contrary, to express the idea of all human knowledge, *not in a circle, but in a regular and concatenated system;* and, like cyclopædia, admits a combination with the preposition. Eighteen encyclo-

pædias would be appurtenant to it, one founded on every order, but the object would not be the same; the explanation of words being merely contemplated. These; with an introduction, investigating the proper divisions of human knowledge; and a supplement, for additions, corrections, and other matters; would make up the whole work; to which might be attached, the *classica*, of the order; or chronological succession of books deducing the knowledge it contains. The term selected for introduction is that of, *isagogia;* from, εισαγωγη, introductio; and that for supplement, *epanorthosia;* from, επανορθωσις, emendatio, emendation.

509. The completion of the first table.

These observations complete the explanation of the first table. It will be time now to develope what is intended by the second table.

510. The second table explained.

The preceding view of human knowledge is that which a being superior to man might be supposed to take of it; imagining such a being to possess it exactly as it is, and susceptible of no increment or diminution. But man is compelled to take a view of his own knowledge, *with a reference to the means by which he obtains it.* He cannot intuitively, and by a mere intellectual operation, come to the possession of the knowledge which he is capable of acquiring. Means must be used; and the knowledge connected with the use and application of those means forms, itself, no inconsiderable, or unimportant, part of his general science. Human language

No. I.

A TABLE OF THE NOMENCLATURE OF UNIVERSAL SCIENCE,

As proposed by Mr. Woodward, Philadelphia, August 31st, 1816.

THE FIRST TABLE.

UNIVERSAL SCIENCE.	PROVINCES.	CLASSES.	ORDERS.	SCIENCES.
I. Catholepistemia.	I. Hylica.	I. Mathematica.	I. Arithmetica.	1. Arithmia. 2. Analysia.
			II. Geömetrica.	1. Geömetria. 2. Goniametria. 3. Ancylometria.
		II. Physica.	I. Physiognostica.	1. Geögnosia. 2. Oryctognosia. 3. Phytognosia. 4. Zoögnosia.
			II. Physiosophica.	1. Stereosophia. 2. Hydrosophia. 3. Aërosophia. 4. Photosophia. 5. Electrosophia. 6. Magnetosophia.
			III. Uranica.	1. Astronomia.
			IV. Chymica.	1. Chymia.
	II. Hylennœica.	I. Anthropoglossica.	I. Grammatica.	1. Grammatia. 2. Anthropoglossia.
			II. Dialectica.	1. Logiotetia. 2. Rhetoria.
			III. Callilogica.	1. Callilogia. 2. Poësia. 3. Euphradia. 4. Diacrisia.
		II. Anthropodynamica.	I. Iatrica.	1. Anatomia. 2. Zoönomia. 3. Therapeutria. 4. Anthropiatria. 5. Chirurgia. 6. Mæeutria. 7. Zoötomia. 8. Zoïatria.
			II. Œconomica.	1. Geörgia. 2. Chirotechnia. 3. Callitechnia. 4. Emporia. 5. Politœcia.
			III. Ethica.	1. Ethosophia. 2. Themistia. 3. Politarchia. 4. Ethnonomia.
			IV. Polemitactica.	1. Pezotaxia. 2. Hippotaxia. 3. Barytotaxia. 4. Sthenotaxia. 5. Erismatotaxia. 6. Stratotaxia. 7. Polemitaxia. 8. Nautotaxia.
		III. Diegetica.	I. Geöcosmica.	1. Chroniotetia. 2. Geöcosmia.
			II. Historica.	1. Hodœporia. 2. Biotetia. 3. Historia. 4. Archæotetia.
	III. Ennœica.	I. Ennœica.	I. Psychica.	1. Zoönœia. 2. Anthroponœia.
			II. Pneumatica.	1. Pneumatia. 2. Theotetia.
			III. Eusebica.	1. Ethnilatria. 2. Hebræosebia. 3. Evangelia. 4. Eleutheria.
Totals 1	3	6	18	64

No. II.

A TABLE OF THE NOMENCLATURE OF UNIVERSAL SCIENCE,

As proposed by Mr. Woodward, Philadelphia, August 31st, 1816.

THE SECOND TABLE.

THE ENLARGED CATHOLEPISTEMIA.	THE EPARCHIA.	THE SYNŒCIA.	THE DIORISMIA.	THE EPISTEMIA.
			Isagogia.	
I. Encatholepistemia.	I. Hetærica.	I. Anthropoglossica.	I. Grammatica.	1. Grammatia. 2. Anthropoglossia.
			II. Dialectica.	3. Logiotetia. 4. Rhetoria.
			III. Callilogica.	5. Callilogia. 6. Poësia. 7. Euphradia. 8. Diacrisia.
		II. Mathematica.	IV. Arithmetica.	9. Arithmia. 10. Analysia.
			V. Geömetrica.	11. Geömetria. 12. Goniametria. 13. Ancylometria.
	II. Æsthetica.	III. Physica.	VI. Physiognostica.	14. Geögnosia. 15. Oryctognosia. 16. Phytognosia. 17. Zoögnosia.
			VII. Physiosophica.	18. Stereosophia. 19. Hydrosophia. 20. Aërosophia. 21. Photosophia. 22. Electrosophia. 23. Magnetosophia.
			VIII. Uranica.	24. Astronomia.
			IX. Chymica.	25. Chymia.
		IV. Anthropodynamica.	X. Iatrica.	26. Anatomia. 27. Zoönomia. 28. Therapeutria. 29. Anthropiatria. 30. Chirurgia. 31. Mæeutria. 32. Zoötomia. 33. Zoïatria.
			XI. Œconomica.	34. Geörgia. 35. Chirotechnia. 36. Callitechnia. 37. Emporia. 38. Politœcia.
			XII. Ethica.	39. Ethosophia. 40. Themistia. 41. Politarchia. 42. Ethnonomia.
			XIII. Polemitactica.	43. Pezotaxia. 44. Hippotaxia. 45. Barytotaxia. 46. Sthenotaxia. 47. Erismatotaxia. 48. Stratotaxia. 49. Polemitaxia. 50. Nautotaxia.
		V. Diegetica.	XIV. Geöcosmica.	51. Chroniotetia. 52. Geöcosmia.
			XV. Historica.	53. Hodœporia. 54. Biotetia. 55. Historia. 56. Archæotetia.
	III. Ennœica.	VI. Ennœica.	XVI. Psychica.	57. Zoönœia. 58. Anthroponœia.
			XVII. Pneumatica.	59. Theotetia.
			XVIII. Eusebica.	60. Ethnilatria. 61. Hebræosebia. 62. Evangelia. 63. Eleutheria.
			Epanorthosia.	
Totals 1	3	6	20	63

is the instrument of science to man; and hence the knowledge of the instrument becomes prior, in the order of things, and according to the course of nature, to the knowledge which, by the use and application of that instrument, may be afterwards obtained.

511. The anthropoglossic sciences transplanted.

Hence, all the sciences, and orders of sciences, having their common base in human speech, or language, are taken from their place, as deduced and evolved, in the first table; and carried to the head of the second table, preceding all other kinds of knowledge.

512. Occasions the discovery of a new affinity of the mathematical sciences.

This operation having been performed, the instrument of all knowledge being placed before the subject to which it is to be applied; an examination is made, through the remainder of the first table, to find if there is any other department of knowledge which possesses the same character, that of being, *merely instrumental.* It is perceived, that the same relation which language bears to all human knowledge in general, the department of mathematica bears to the department of physica. The one is merely instrumental or auxiliary to the other. Neither language, nor mathematics, are any real knowledge in themselves; and if the information, which they are the instruments of obtaining, were intuitive, or could be communicated by a different process, they would be entirely useless. Hence language and mathematics may be denominated *auxiliary sciences;* to distinguish them from *positive* or *principal sciences.*

513. The combination produces a new province.

They are thus formed into a province, and the name imparted to that province is, *hetærica;* from, ἑταιρος, socius, an ally or auxiliary in war. The Greek language furnishes a variety of terms for an ally. It distinguishes between an offensive and a defensive ally. The term, ἑταιρος, seems to be general in its import. The commander of the auxiliary forces, at Constantinople, was termed the *hetæriarch.* There are singular associations in the Greek, as in other languages. The same radix, which denotes the Divine Being, signifies, also, *sulphur;* and that, at present under consideration, was applied to a lady, whose deportment was less rigid, than the rules of elegant society require.

514. Part of the remaining sciences combine and form a second new province.

Among the remaining, or *positive sciences*, it will be found that three classes of them are distinguished by this prominent feature; *that they have relation to sensible objects.* The sciences then *which relate to objects of sensation*, are reduced into a province, and to that province is imparted the name of, *æsthetica;* from, αισθησις, sensatio, sensation. The introduction of this term into modern language, by professor Baumgarten, has not, like that of, dynamica, by D'Alembert, obtained so much approbation as to present an impediment; and the medical authorities only sanction the selection.

The sciences relating to mind remain unchanged.

515. Two provin-

Thus, in the second table, the two provinces, hylica and hylennœica, of the first table, have

become evanescent; and are absorbed into the two other provinces of, hetærica, and æsthetica.

ces of the first table become evanescent.

This is all the alteration effected in the second table. The class, anthropoglossica, is taken from its place, in the first table; and carried to the head of the second. The class, mathematica, which it then comes to precede, is consolidated with it, as possessing the same character of being, *auxiliary;* and the two classes are formed into a distinct province. The remaining three classes of, physica, anthropodynamica, and diegetica, are then formed into another province; as they agree among themselves in this characteristic, that they all relate to objects which are, or have been, *sensible.* The succession of the epistemias, and of the various orders, after the removal of the class, anthropoglossica, remains entirely unchanged.

516. The completion of the second table.

This completes the system which has been devised.

517. The completion of the system.

There are eleven modes of representing it to the eye; by a table, by a tree, by a column, by a pyramid, by a river, by a chart, by a map, by an arcade, by festoons, by a genealogical table, and by concentric circles. The tabular form is the most convenient to him whose primary object is to criticise the nomenclature. This, or any other nomenclature, being adjusted; the figure of the tree, perhaps, represents the divisions in the most expressive manner. The columnar form is defective in one particular. The generic terms

518. Modes of representing it to the eye.

must be applied on both sides. The pyramidal form is not elegant. The river is only the tree reversed. The chart and map require some aid from the fancy. The festoons and genealogical table have no particular recommendations. The concentric circles, and the arcade, form, together with the tree, very beautiful objects; particularly when executed on a large scale. Eight engravings, calculated for a book, represent the system, very well, in a detached form. The two tables, as far as the classes, in trees, and then a separate tree for each class, make very fine, singular, and complete exhibitions of the system. The form of trees is also by far the best for a comparison of various systems. Those of Lord Bacon, D'Alembert, and Mr. Jefferson, have been reduced, for comparison, into that form.

The first form alone, that of plain tables, somewhat in the manner of that of the new chemistry, is adopted for the present. It is the most commodious to familiarize the mind with the nomenclature. Some persons have attempted to understand the system by an inspection of the tables of nomenclature alone; without an explanation of the details of their construction. This has uniformly been attended with a bad effect. In this, as in many other instances with respect to knowledge, impatience defeats its own object.

519. Incidental remarks. There is room for great discretion in spreading out any order into specific sciences; but any person who shall satisfactorily shew that the *succession of the orders* ought to be, in the least re-

spect, changed, will detect a defect in the system. In like manner, if it could be shewn that an additional order is requisite, the defect would be material. A diminution of the number of the orders, leaving the succession the same, would not be so material; but no person has attempted this. Nor would the ascending concatenation be essential.

The orders have only been attacked in three instances; and the changes produced, if the suggestions were adopted, would not be essential. Dr. Patterson would invert the succession of uranica and chymica. Col. Randolph would throw the two first epistemias in the class, ennœica, or the order, psychica, back into the second province, of the first table, hylennœica. Mr. Jefferson was of an opposite opinion; and would have them retained where they at present are. The reverend Mr. Ely would add, in that order, the science, pneumatia, and would then alter the names of that, and of the succeeding order; retaining their places in the class and province. An experiment has been tried, if the place of the class, diegetica, could be changed; and without any effect. The orders, iatrica, and œconomica, have been tried in the class, physica; with bad effects. The same remark may be made respecting the order, polemitactica.

The reverend Mr. Milnor, of Philadelphia, as well as bishop Hobart, of New-York, and the attorney-general of the Territory of Michigan, entertained a curiosity to be acquainted with my

views respecting the received terms; and, severally, made direct enquiries on that subject. My views respecting the received terms are, that they ought all to be retained, nearly as established in the specific nomenclature of Mr. Chambers; but that, in use, these would be *colloquial*, while those of the new nomenclature, so far as received, would be *technical*.

The introduction of the term, *epistemia*, colloquially, has been found indispensable. It is the only term, of that character, of which the admission has been seriously sought. A few fresh expressions, such as, *anthropic* intellect, *anthropic dynamis*, *andrapodistic* war, and others; have, in the body of the discussion, been incidentally scattered, as provender for Caledonian critics. One of them, indeed, that of *anthropic dynamis*, is intended for the real use of their medical and metaphysical writers. If this term, instead of traversing half the occidental hemisphere, and the whole of the Atlantic ocean, had been introduced among themselves, which would at once have given it the stamp of genuine coin, we should not have found Dr. Reid *placing the fine arts in the spiritual world;* and Dr. Brown *defining agriculture as a part of the science of medicine.*

Some American gentlemen, and particularly the Rev. Dr. Harris, the president of Columbia college, at New-York, have been extremely desirous of the introduction, along with the term, *epistemia*, of a set of corresponding terms, of Grecian etymology, for the equivalent colloquial

words of, *order*, *class*, and *province;* and I have placed the best which occur to me at the head of the second table.

The fourth part of this investigation; relative, principally, to an American National Institute; must necessarily be deferred. The supreme court of the Territory of Michigan commences its annual session on the sixteenth day of September; and there remains barely time for the performance of the journey.

A. E. B. Woodward.

Philadelphia, August 31*st,* 1816.

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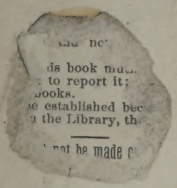
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